U.S. Department of the Interior

Bureau of Land Management

Northeastern Great Basin Standards and Guidelines Assessment

Draft Determinations
For
South Jiggs Complex:

Achurra Seeding, Browne, Corral Canyon Seeding, Corta FFR, Lindsay Creek, Little Porter, Little Porter FFR, Merkley-Zunino Seeding, Mitchell Creek, Pearl Creek, Robinson Creek, Robinson Mountain, Robinson Mountain FFR, Twin Creek East, Twin Creek North, and Twin Creek South Allotments

September, 2014

Location: Elko County, Nevada

It is the mission of the Bureau of Land Management
to sustain the health, diversity, and productivity of the public lands
for the use and enjoyment of present and future generations.

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I. Introduction

The Bureau of Land Management (BLM) grazing regulations at 43 CFR 4130.3-1(c) require that grazing permits issued by the BLM contain terms and conditions that ensure conformance with BLM regulations at 43 CFR 4180, which are the regulations under which the *Northeastern Great Basin Standards and Guidelines for Grazing Administration (1997)* were developed. Recently, the Tuscarora Field Office completed an assessment of the achievement of these standards on the **Achurra Seeding, Browne, Corral Canyon Seeding, Corta Fenced Federal Range (FFR), Lindsay Creek, Little Porter, Little Porter FFR, Merkley-Zunino Seeding, Mitchell Creek, Pearl Creek, Robinson Creek, Robinson Mountain, Robinson Mountain FFR, Twin Creek East, Twin Creek North, and Twin Creek South Allotments**. The results of this assessment are presented in this report. This assessment outlines the BLM's draft determination as to (1) whether these standards are being met, and, (2) if they are not being met, whether existing grazing management practices have contributed to their lack of attainment. The approved standards and guidelines for rangeland health are as follows:

Standard 1. Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform.

Guidelines

1.1 Livestock grazing management and wild horse and burro population levels are appropriate when in combination with other multiple uses they maintain or promote upland vegetation and other organisms and provide for infiltration and permeability rates, soil moisture storage, and soil stability appropriate to the ecological site within management units.

1.2 When livestock grazing management and wild horse and burro management alone are not likely to restore areas of low infiltration or permeability, land management treatments should be designed and implemented where appropriate.

1.3 Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this standard.

Standard 2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Guidelines

2.1 Livestock grazing management and wild horse and burro population levels will maintain or promote sufficient vegetation cover, large woody debris, or rock to achieve proper functioning condition in riparian and wetland areas. Supporting the processes of energy dissipation, sediment capture, groundwater recharge, and stream bank stability will thus promote stream channel morphology (e.g., width/depth ratio, channel roughness, and sinuosity) appropriate to climate, landform, gradient, and erosional history.

2.2 Where livestock grazing management and wild horse and burro management are not likely to restore riparian and wetland sites, land management treatments should be designed and implemented where appropriate to the site.

2.3 Livestock grazing management and wild horse and burro heard management will maintain, restore or enhance water quality and ensure the attainment of water quality that meets or exceeds state standards.

2.4 Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this standard.

This standard **only applies** to the Achurra Seeding, Browne, Lindsay Creek, Mitchell Creek, Pearl Creek, Robinson Creek, Robinson Mountain, Robinson Mountain FFR, Twin Creek East, Twin Creek North, and

Twin Creek South Allotments. This standard **does not apply** Corral Canyon Seeding, Corta FFR, Little Porter, Little Porter FFR and Merkley-Zunino Seeding Allotments since the riparian habitat are lacking or occur only in limited amounts; therefore, the riparian and wetlands site standard will not be considered for these allotments.

Standard 3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

Guidelines

3.1 Livestock grazing management and wild horse and burro population levels will promote the conservation, restoration and maintenance of habitat for threatened and endangered species, and other special status species as may be appropriate.

3.2 Livestock grazing intensity, frequency, season of use and distribution and wild horse and burro population levels should provide for growth and reproduction of those plant species needed to reach long-term land use plan objectives. Measurements of ecological condition and trend/utilization will be in accordance with techniques identified in the *Nevada Rangeland Monitoring Handbook.*

3.3 Livestock grazing management and wild horse and burro management should be planned and implemented to allow for integrated use by domestic livestock, wildlife, and wild horses and burros consistent with land use plan objectives.

3.4 Where livestock grazing management and wild horse and burro herd management alone are not likely to achieve habitat objectives, land treatments may be designed and implemented as appropriate.

3.5 When native plant species adapted to the site are available in sufficient quantities, and it is economically and biologically feasible to establish or increase them to meet management objectives, they will be emphasized over non-native species.

3.6 Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this Standard.

Standard 4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple-use.

Guidelines

4.1 Rangeland management plans will consider listings of known sites that are National Historic Register eligible or considered to be of cultural significance and new eligible sites as they become known.

4.2 Wild horse and burro herd management will be designed to avoid or mitigate damage to significant cultural resources.

Standard 5. Wild horses and burros exhibit characteristics of a healthy, productive, and diverse population. Age structure and sex ratios are appropriate to maintain the long-term viability of the population as a distinct group. Herd management areas are able to provide suitable feed, water, cover and living space for wild horses and burros and maintain historic patterns of habitat use.

Guidelines

5.1 Implement the objectives outlined in the Wild Free-Roaming Horses and Burros tactical Plan for Nevada (May 1999).

5.2 Manage for wild horses and/or burros in herd management areas based on the capability of the HMA to provide suitable feed, water, cover and living space for all multiple uses.

5.3 Set appropriate Management Levels based on the most limiting habitat factor (eg. available water, suitable forage, living space and cover) in the context of multiple use.

5.4 Manage herd management area populations to preserve and enhance physical and biological characteristics that are of historical significance to the herd.

5.5 Manage wild horse and burro herds for short and long term increases and to enhance adoptability by ensuring that wild horses and burros displaying desirable traits are preserved in the herd thus providing a reproductive base to increase highly adoptable horses and burros for future demands.

5.6 Identify and preserve historic traits and characteristics within the herd which have proven to be highly desirable by the adoption public to increase the long term availability of animals bearing these features.

5.7 Wild horse and burro selective removal criteria are modified on a per herd basis to correct deficiencies in population age and sex ratios which threaten short and long term genetic diversity and reproductive health.

This standard **only applies** to the West Pasture of the Browne Allotment as a portion of the Diamond Hills North herd management area (HMA) is within the Browne Allotment. This standard **does not apply** to Achurra Seeding, Corral Canyon Seeding, Corta FFR, Lindsay Creek, Little Porter, Little Porter FFR, Merkley-Zunino Seeding, Mitchell Creek, Pearl Creek, Robinson Creek, Robinson Mountain, Robinson Mountain FFR, Twin Creek East, Twin Creek North, and Twin Creek South Allotments as there are neither wild horse herd management areas nor wild horses within them.

II. Allotment Descriptions

The allotments are located approximately 35-52 miles south of Elko, Nevada, and 3-15 miles south of Jiggs, Nevada, on State Route 228. Elevations range from 5,300 feet to 6,680 feet, and the annual precipitation for the area is approximately 8-10 inches received primarily as snow. As part of an approximate 100,000 acre conversion completed in the Spring Creek/Lamoille area to the south of Jiggs in the 1950's and 1960's large portions of the allotments were converted to crested wheatgrass (*Agropyron cristatum*).

Greater Sage-Grouse (*Centrocercus urophasianus*; sage-grouse), a Candidate Species for listing as Threatened or Endangered under the Endangered Species Act, has Preliminary Priority Habitat (PPH) within the South Jiggs Complex. PPH comprises areas that have been identified as having the highest conservation value to maintaining sustainable Greater Sage-Grouse populations; including, breeding, late brood-rearing and winter concentration areas. The South Jiggs Complex contains approximately 63,900 acres of PPH for sage-grouse (Appendix B, Map 2).

This complex provides habitat for numerous other wildlife species that may use these allotments during all or portions of the year, including migratory birds, raptors, small and large mammals, reptiles, amphibians, and bats. Some of these may be BLM Special Status Species.

Common riparian and wetland plant species documented for the South Jiggs Allotments include Nebraska sedge (*Carex nebrascensis*), arctic rush *(Juncus arcticus*), spikerush (*Eleocharis* spp.), several species of willows (*Salix* spp.), black cottonwood (*Populus balsamifera* ssp. *Trichocarpa*) and quaking aspen (*Populus tremuloides*). Many areas also support what are considered "facultative" plants (species which can occur equally both in riparian areas and on uplands) and plants species associated with disturbance. These plants including such species as Kentucky bluegrass (*Poa pratensis*), common

dandelion (*Taraxacum officinale*), western aster (*Aster occidentalis*) and wild rose (*Rosa woodsii*), typically occur at the margins of drying riparian areas and are generally indicative of long-term grazing impacts.

The Achurra Seeding Allotment has a 1973 Allotment Management Plan (AMP) with a 1990 Addendum to the Huntington Creek AMP. The Achurra Seeding and Twin Creek East Allotments made up the original 1973 AMP. In 1990 the permittee transferred grazing out of the West Pasture of the Twin Creek East Allotment to graze in the Twin Creek South Allotment, therefore; including the Twin Creek South Allotment into the Huntington Creek Allotment Management Plan Addendum in 1990. Currently authorization 2701500 is authorized to graze in the Achurra Seeding, the East Pasture of Twin Creek East, and the Twin Creek South Allotments. Achurra Seeding has two pastures the East and West Pastures. The grazing management follows a four year system with the seedings being deferred during the critical growing period two out of four years. Twin Creek East Allotment is made up of two pastures the East and West Pastures. Additionally, authorization 2701505 is also authorized to graze in the West Pasture of the Twin Creek East Allotment.

The Browne and Lindsay Creek Allotments are currently grazed by authorization 2701516. During the 1999 and 2000 fire seasons the Browne Allotment was affected by three large fires including the Sadler, Basin and Railroad Fires. As a result of these fires the Browne Allotment was closed to livestock grazing from August 2000 through the end of the growing season in 2002. A total of 10,900 acres within the allotment was burned by the three fires. The northern portion of the Browne Allotment is dominated by crested wheatgrass, but no water to make use of the crested wheatgrass. A portion of the Diamond Hills North Herd Management Area (HMA) is located within the Browne Allotment. In 1997 the permittee signed a conservation agreement placing a portion of their preference into non-use. The Browne Allotment is made up of two pastures the Main Field and the Saddler Field. The Lindsay Creek Allotment is split into three pastures that include Pearl Pasture, Brown Pasture and Lindsay Pasture. No formal AMP has been developed for either the Browne or Lindsay Creek Allotments.

The Corral Canyon Seeding and the Corta FFR Allotments are currently grazed by authorization 2701518. Neither allotment has a formal grazing Allotment Management Plan. The Corral Canyon Seeding is primarily a crested wheatgrass seeding. The Corta FFR Allotment is primarily private land with only approximately 60 acres of public land within the allotment.

The Little Porter, Little Porter FFR, Merkley-Zunino Seeding, Robinson Mountain and Robinson Mountain FFR Allotments are grazed by authorization 2701606. Robinson Mountain, Robinson Mountain FFR, Little Porter, Little Porter FRR, and Merkely-Zunino Seeding are under grazing authorization # 2701606 for cattle. Robinson Mountain is managed through the Robinson Mountain Allotment Management Plan of 1986. Robinson Mountain is made up of four pastures including: North Rose Field, South Rose Field, Middle Field, West Field, and have a total of 3002 active Animal Unit Months (AUMs). Robinson Mountain FFR, Little Porter, Little Porter FFR, and Merkely-Zunino Seeding do not have formal AMPs.

Robinson Creek Allotment is grazed by authorizations 2703921 and 2701578. The west pasture of Robinson Creek was affected by the Little Red fire in the 90's and the Sadler fire in 1999. The Sadler Fire burned approximately 10,000 acres of the allotment. The Robinson Creek Allotment has a total of 1572 active AUMs. Robinson Creek Allotment has no formal AMP.

The Pearl Creek and Twin Creek North Allotments are both grazed by authorization 2701505. The Pearl Creek Allotment is made up of two pastures the East and West Pastures. There is no formal AMP for the Pearl Creek Allotment however one pasture is generally deferred each year. Both pastures are crested wheatgrass seedings. The Twin Creeks North Allotment has one pasture that is a crested wheatgrass seeding. The 1991 Final Decision implemented a deferred grazing system every other year.

Mitchell Creek is used by two livestock permittees, authorization 2701558 is permitted to graze cattle while authorization 2703665 is permitted to graze sheep within the allotment. There are a total of 1,081 active cattle AUMs and 220 active sheep AUMs permitted on the allotment. The allotment consists of four pastures, the Belmont North, Belmont South, Elko Seeding, and White Pine Seeding Pastures. The cattle permittee grazes in a rest rotation system with two pastures on US Forest Service in conjunction with the Elko and White Pine Seedings in the allotment. The cattle operation has a 1979 grazing agreement with BLM and the US Forest Service. There is no formal AMP for the sheep operation, and in most years the sheep go through other allotments and then use the Mitchell Creek Allotment later in the summer.

Information including authorization number, number of livestock, kind of livestock, permit dates and AUMs by allotment are found in Table A.

Table A. Permitted Use by Allotment

Allotment	Authorization	Livestock Number	Livestock Kind	Permit Dates	AUMs
Achurra Seeding	2701500	115	Cattle	4/16-10/31	757
Browne	2701516	163	Cattle	5/16-9/15	657
Corral Canyon Seeding	2701518	88	Cattle	4/15-10/12	525
Corta FFR	2701518	45	Cattle	4/20-6/20	92
Lindsay Creek	2701516	206	Cattle	4/16-10/30	1,348
Little Porter	2701606	43	Cattle	4/15-10/31	288
Little Porter FFR	2701606	24	Cattle	6/17-7/17	24
Merkley-Zunino Seeding	2701606	22	Cattle	4/15-10/31	139
Mitchell Creek	2701558	166	Cattle	4/16-10/30	1,081
	2703665	176	Sheep	5/10-11/15	220
Pearl Creek	2701505	101	Cattle	4/16-10/30	657
Robinson Creek					
Robinson Mountain	2701606	Varies by pasture	Cattle	4/15-10/25	3,002
Robinson Mountain FFR	2701606	36	Cattle	6/17-7/17	37
Twin Creek East	2701500 (East Pasture)	49	Cattle	4/16-10/31	321
	2701505 (West Pasture)	51	Cattle	4/16-10/23	320
Twin Creek North	2701505	119	Cattle	4/16-10/25	755
		150	Cattle	10/2-11/2	158
Twin Creek South	2701500	59	Cattle	4/16-10/31	386

III. Draft Determinations

Draft determinations regarding achievement of Rangeland Health Standards for the South Jiggs Complex are in Tables B-Q by allotment, and by standard in Tables R-V. For the complete data and analysis refer to Appendix A.

Table B. Achurra Seeding Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard	Livestock; non-functional water developments	Not in Conformance
Habitat	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table C. Browne Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	East pasture achieving West Pasture not achieving standard	Not Applicable Livestock and wild horses	In Conformance Not in Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance
Healthy Wild Horse and Burro Populations	Not achieving standard but making significant progress	Wild horses	In Conformance

Table D. Corral Canyon Seeding Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Habitat	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table E. Corta FFR Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Habitat	Undetermined		
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table F. Lindsay Creek Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard	Livestock; intermittent flow condition	Not in conformance, but applicability limited by intermittent conditions
Habitat	Seeding – Not achieving standard but making significant progress Native – Not achieving standard	Seeding – Habitat type-conversion Native – Livestock	Seeding – In Conformance Native – Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table G. Little Porter Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table H. Little Porter FFR Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table I. Merkley-Zunino Seeding Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table J. Mitchell Creek Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard	Livestock; intermittent flow conditions and non-functional water developments	Not in conformance
Habitat	Belmont Field and Elko Seeding – Achieving standard White Pine Seeding – Not achieving standard	Habitat type-conversion	Belmont Field, Elko Seeding and Native Areas in Conformance White Pine Seeding Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table K. Pearl Creek Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Achieving standard	Not Applicable	In Conformance
Habitat	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table L. Robinson Creek Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard, but making significant progress	Livestock	In Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table M. Robinson Mountain Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard	Livestock	Not in Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table N. Robinson Mountain FFR

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard	Livestock	Not in Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table O. Twin Creek East Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard, but making significant progress	Livestock	In Conformance
Habitat	Not achieving standard	Livestock	Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table P. Twin Creek North Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard	Livestock	Not in Conformance
Habitat	Native - Not achieving standard but making significant progress Seeding – Not achieving standard	Livestock	Native - In Conformance Seeding – Not in Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Table Q. Twin Creek South Allotment

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving standard	Not Applicable	In Conformance
Riparian and Wetland Sites	Not achieving standard	Livestock; non-functional water developments	Not in Conformance
Habitat	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance
Cultural Resources	Achieving standard	Not Applicable	In Conformance

Standard 1. Upland Sites

Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform.

As indicated by:

- Indicators are canopy and ground cover, including litter, live vegetation and rock, appropriate to the potential of the site.

Table R. Upland Sites

Allotment	Determination	Contributing Factors	Guidelines Conformance
Achurra Seeding	Achieving standard	Not Applicable	In Conformance
Browne	Achieving standard	Not Applicable	In Conformance
Corral Canyon Seeding	Achieving standard	Not Applicable	In Conformance
Corta FFR	Achieving standard	Not Applicable	In Conformance
Lindsay Creek	Achieving standard	Not Applicable	In Conformance
Little Porter	Achieving standard	Not Applicable	In Conformance
Little Porter FFR	Achieving standard	Not Applicable	In Conformance
Merkley-Zunino Seeding	Achieving standard	Not Applicable	In Conformance
Mitchell Creek	Achieving standard	Not Applicable	In Conformance
Pearl Creek	Achieving standard	Not Applicable	In Conformance
Robinson Creek	Achieving standard	Not Applicable	In Conformance
Robinson Mountain	Achieving standard	Not Applicable	In Conformance
Robinson Mountain FFR	Achieving standard	Not Applicable	In Conformance
Twin Creek East	Achieving standard	Not Applicable	In Conformance
Twin Creek North	Achieving standard	Not Applicable	In Conformance
Twin Creek South	Achieving standard	Not Applicable	In Conformance

Approximately 66,000 acres of the South Jiggs Complex was converted into multiple crested wheatgrass seedings in the 1950's and 1960's, these seeding efforts were for the purpose of providing forage for livestock and to increase flexibility in grazing management. Furthermore, much of the complex remains dominated by sagebrush steppe communities; containing, native deep-rooted, perennial bunchgrasses. The dominant ecological site within the complex, including the crested wheatgrass seedings, is a Loamy 8-10" precipitation zone; however, various other ecological sites are found within the South Jiggs Complex and are described in Table 3. The site/soil characteristic, in addition to the average annual precipitation, associated with this ecological site is suitable for producing healthy and relatively vigorous plant communities. Due to the productive nature of such sites, plant communities dominated by crested wheatgrass have the potential of achieving favorable site stabilization characteristics associated with the attainment of this standard.

Ecological site descriptions found within the South Jiggs Complex have a potential natural community that include deep-rooted, cool season perennial bunchgrasses and tall shrubs, such as Wyoming big sagebrush. Other vegetation types include shallow-rooted, cool season perennial bunchgrasses and deep-rooted, cool season perennial forbs. The deep-rooted, cool season perennial bunchgrasses are especially important to slow runoff and increase infiltration, in addition to stabilizing soils through root growth and litter contribution. Shrub canopy and litter at the sites are particularly important to break

raindrop impact and provide for snow catch and accumulation throughout the majority of the South Jiggs Complex.

The shrub composition in many of the areas within the South Jiggs Complex is missing or reduced, due to wildland fires and crested wheatgrass seeding operations; however, in the native areas, deep-rooted, perennial cool season grasses are reduced or missing and have a higher shrub composition. Whether the area is dominated by grasses or shrubs, infiltration and permeability rates within the South Jiggs Complex are what is to be expected within the Loamy 8-10" precipitation site. South facing slopes, areas with high livestock use, and associated burn areas have lower site stability and infiltration due to the decreased vegetative cover.

Changing the composition of a plant community from an undesirable to a desirable state may not always be accomplished solely through passive management changes. Sites that supported a certain plant community even in recent history may not be capable of supporting that same vegetation state again, especially if a change in the controlling factors has caused the site to cross an ecological threshold, making returning to previously existing states difficult and prohibitively costly.

Repeated defoliations during the critical growing seasons can weaken the native grass plants as they devote higher percentages of their stored energies to regrowth. Defoliation of the plant by any means, including fire or grazing by wildlife or livestock forces the plant to use more of its reserves to regrow the removed portions. Repeated grazing during the critical growing season over years can lead to plant mortality. A niche opened by a grazed or recovering plant can provide openings for other species in the community to occupy, either through a decrease in shade or a sudden increase in the availability of moisture and nutrients in the soil. Native grasses tend to produce low numbers of seeds, and the seeds produced have low viability and generally do not survive more than a season. The lack of a seed bank in the soil can mean the eventual disappearance of species from a plant community, creating openings for other species, particularly shrubs or invasive species in the Great Basin.

Recent rangeland monitoring and field observations suggest that sufficient vegetative cover, litter, and rock fragments are present to meet the requirements of this standard given the potential of the sites. In all the allotments within the South Jiggs Complex.

The evaluation of interpreting indicators of rangeland health, point cover, weight-estimate production data, community compositions, key area utilizations, frequency, upland photographic data and professional observations support the assertion that the South Jiggs Complex is meeting the Upland Site standard. The recent drought, as well as fire activity within the complex was taken into consideration in conjunction with rangeland data collected. This is a principally important factor with regard to biotic diversity and annual production in the area. In much of the complex where fires have occurred there has been an increase of invasive species, likely due to a change in functional structural groups of perennial bunch grasses; however, the current vegetative composition and frequency of such vegetation have maintained significant integrative properties in regard to hydrologic function and soil/site stability through root growth and contributing litter cover, as well as effectively lowering cheatgrass occurrence. Considering all the rangeland health data and other factors above, while not optimal, support the assertion that Standard 1 is being met within the South Jiggs Complex.

Standard 2. Riparian and Wetland Sites

Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

As indicated by:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows. Elements indicating proper functioning condition such as avoiding acceleration erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics:

  Width/Depth Ratio;
  Channel roughness;
  Sinuosity of stream channel;
  Bank stability;
  Vegetative cover (amount, spacing, life form); and
  Other cover (large woody debris, rock).

- Natural springs, seep, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering and release as indicated by plant species and cover appropriate to the site characteristics.

- Chemical, physical and biological water constituents are not exceeding the state water quality standards.

Table S. Riparian and Wetland Sites

Allotment	Determination	Contributing Factors	Guidelines Conformance
Achurra Seeding	Not achieving standard	Livestock; non-functional water developments	Not in Conformance
Browne	East Pasture achieving West Pasture not achieving standard	Not Applicable Livestock and wild horses	In Conformance Not in Conformance
Lindsay Creek	Not achieving standard	Livestock; intermittent flow conditions	Not in Conformance, but applicability limited by intermittent conditions
Mitchell Creek	Not achieving standard	Livestock; intermittent flow conditions and non-functional water developments	Not in conformance
Pearl Creek	Achieving standard	Not Applicable	In Conformance
Robinson Creek	Not achieving standard, but making some progress	Livestock	In Conformance
Robinson Mountain	Not achieving standard	Livestock	Not in conformance
Robinson Mountain FFR	Not achieving standard	Livestock	Not in conformance
Twin Creeks East	Not achieving standard, but making significant progress	Livestock	In Conformance
Twin Creek North	Not achieving standard	Livestock	Not in Conformance
Twin Creek South	Not achieving standard	Livestock; non-functional water developments	Not in Conformance
This standard **does not apply** Corral Canyon Seeding, Corta FFR, Little Porter, Little Porter FFR and Merkley-Zunino Seeding Allotments since the riparian habitat are lacking or occur only in limited amounts; therefore, the riparian and wetlands site standard will not be considered for these allotments.			

Generally, riparian and wetland habitat conditions for many of the South Jiggs Complex are degraded as a result of long-term use by livestock throughout the growing season on an annual basis. Heavy grazing of riparian plant species as well as trampling and compaction of hydric soils has led to loss of riparian plants, channel incision, draining of floodplains and shrinking and drying of historic meadow areas. Some areas are or have become mostly intermittent and response potential is limited by lack of persistent soil moisture. In all cases, poor habitat conditions have been exacerbated by drought during the past two years. On the Pearl Creek Allotment, exclosure fencing has allowed for improvement of riparian habitat conditions along Pearl Creek.

For most allotments, grazing impacts to riparian areas are the result of cattle. In the case of the Browne Allotment, impacts are also the result of wild horse use. Both cattle and domestic sheep are present in the Mitchell Creek Allotment.

A number of lentic riparian sites were developed in the past to provide livestock water. Most of these developments are no longer functional but the spring sites still contain rusted or leaking troughs, parts of collection systems, broken pipes and fencing materials including wire and posts. In many cases, the un-functioning developments have altered flow patterns causing drying of spring sources and/or portions of downstream drainages.

State water quality standards have not been met for aquatic life standards on Pearl Creek (Pearl Creek Allotment) and Robinson Creek (Robinson Mountain Allotment) as a result of exceedances for temperature and/or total phosphorus (NDEP 2014). As such, these streams are classified as "impaired" and are on the State of Nevada's 303d list for water quality (NDEP 2014). Standards have either been met or data are insufficient to make a determination for all other water bodies in the South Jiggs Complex including perennial drainages and seeps and springs. Generally, improvements in riparian habitat conditions can be inferred to improve water quality (Kozlowski 2012 and Pahl 2010).

Results of stream surveys and functioning condition assessments for both lotic and lentic areas for allotments with riparian resources are summarized in Appendix A.

Standard 3. Habitat

Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

As indicated by:

- Vegetation composition (relative abundance of species);
- Vegetation structure (life forms, cover, heights or age classes)
- Vegetation distribution (patchiness, corridors);
- Vegetation productivity; and Vegetation nutritional values.

Table T. Habitat

Allotment	Determination	Contributing Factors	Guidelines Conformance
Achurra Seeding	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance
Browne	Not achieving standard	Livestock	Not In Conformance
Corral Canyon Seeding	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance
Corta FFR	Undetermined		
Lindsay Creek	Seeding- Not achieving standard but making significant progress Native- Not achieving standard	Seeding- Habitat type-conversion Native- Livestock	Seeding- In Conformance Native- Not In Conformance
Little Porter	Not achieving standard	Livestock	Not In Conformance
Little Porter FFR	Not achieving standard	Livestock	Not In Conformance
Merkley-Zunino Seeding	Not achieving standard	Livestock	Not In Conformance
Mitchell Creek	Belmont Field and Elko Seeding- Achieving standard White Pine Seeding- Not achieving standard	Habitat type-conversion	Belmont Field, Elko Seeding, and Native Area In Conformance White Pine Seeding Not In Conformance
Pearl Creek	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance
Robinson Creek	Not achieving standard	Livestock	Partially in Conformance
Robinson Mountain	Not achieving standard	Livestock	Partially in Conformance
Robinson Mountain FFR	Not achieving standard	Livestock	Not in Conformance
Twin Creek East	Not achieving standard	Livestock	Not in Conformance
Twin Creek North	Native- Not achieving standard but making significant progress Seeding- Not achieving standard	Livestock	Native- Partially in Conformance Seeding- Not in Conformance
Twin Creek South	Not achieving standard but making significant progress	Habitat type-conversion	In Conformance

Note: With the exception of Mitchell Creek Allotment (Lahontan cutthroat trout) under Standard 2, the guideline statement regarding, "Habitat conditions meet life cycle requirements of threatened and endangered species" does not apply.

Standard 4. Cultural Resources

Land use plans will recognize cultural resources within the context of multiple-use.

Table U. Cultural Resources

Complex	Determination	Contributing Factors	Guidelines Conformance
South Jiggs	Achieving standard	Not Applicable	In Conformance

Rangeland management plans, including term grazing permit renewals, will consider known Cultural Resource sites that are eligible for listing on the National Register of Historic Places (NRHP) or considered to be of cultural significance as well as new NRHP eligible sites as they become known. Based on evaluation of existing information pertaining to range improvements and grazing management, Cultural Resources are being recognized within the context of multiple-use management in the South Jiggs Allotments.

Standard 5. Healthy Wild Horse and Burro Populations

Wild horses and burros exhibit characteristics of a healthy, productive, and diverse population. Age structure and sex ratios are appropriate to maintain the long-term viability of the population as a distinct group. Herd management areas are able to provide suitable feed, water, cover and living space for wild horses and burros and maintain historic patterns of habitat use.

As indicated by:

- Healthy rangelands that provide sufficient quantities and quality of forage and water to sustain the appropriate management level on a yearlong basis within a herd management area.
- Wild horses and/or burros managed on a year-long basis for a condition class greater than or equal to five to allow them normal chances for survival in the winter.
- Highly adoptable wild horses and burros that are readily available from herd management areas.
- Wild horses and burro herds that exhibit appropriate age structure and sex ratio for short and long term genetic and reproductive health.

Table V. Healthy Wild Horse and Burro Populations

Allotment	Determination	Contributing Factors	Guidelines Conformance
Browne	Not achieving standard but making significant progress	Wild Horses	In Conformance
This standard **does not apply** to Achurra Seeding, Corral Canyon Seeding, Corta FFR, Lindsay Creek, Little Porter, Little Porter FFR, Merkley-Zunino Seeding, Mitchell Creek, Pearl Creek, Robinson Creek, Robinson Mountain, Robinson Mountain FFR, Twin Creek East, Twin Creek North, and Twin Creek South Allotments as there are neither wild horse herd management areas nor wild horses within them.			

While there is sufficient forage to sustain the appropriate management level of wild horses in the West Pasture of the Browne Allotment, limited water is available for wild horses. This limited water has led to some impacts by wild horses to riparian areas as outlined in Standard 2. BLM gathered and removed

150 wild horses in 2013 which should alleviate some of the impacts to the riparian areas in the Herd Management Area (HMA).

The wild horses are able to sustain a condition class of five or better which allows them normal chances for survival in winter. The wild horses in the West Pasture of the Browne Allotment are part of a larger population and are able to mix with other wild horses in adjacent HMAs which enhances their long term genetic and reproductive health.

IV. Signature Page

_____ _____

Richard E. Adams
Field Manager
Tuscarora Field Office

Date

Appendix A. Monitoring Data Summaries

Livestock Actual Use

Livestock actual use data from 2003 to 2013 are summarized in Tables 1-1 and 1-2. Annual variation in livestock use has occurred for several reasons including various business decisions of permittees, annual forage availability, and other management actions by permittees and the BLM.

Table 1-1. Total Reported Actual Use by Allotment

	Achurra Seeding	Browne	Corral Canyon Seeding	Corta FFR	Lindsay Creek	Little Porter	Little Porter FFR	Merkley-Zunino Seeding
Year	AUMs	AUMs	AUMs	AUMs	AUMs	AUMs	AUMs	AUMs
2013	149*	655*	425*	92*	1,027*	255*	24*	125*
2012	No Data	655*	524*	92*	1,308*	255*	24*	96*
2011	196*	655*	524*	68*	1,308*	285*	24*	97*
2010	47	655	836	94*	521	182	24*	194
2009	234	656	None Use	Non Use	625	163	24*	282
2008	243	646	662	94*	605	285	24*	182
2007	229	659	518	94*	379	242	24*	236
2006	294	1282	524*	94*	552	227	24*	192
2005	500	1178	578	94*	432	263	24*	736
2004	256	1223	666	94*	501	221	24*	372
2003	367	791	556	94*	234	316*	24*	133*
*** Billed use, not actual use was used since the actual use reports were missing.**								

Table 1-2. Total Reported Actual Use by Allotment

	Mitchell Creek	Pearl Creek	Robinson Creek	Robinson Mountain	Robinson Mountain FFR	Twin Creek East	Twin Creek North	Twin Creek South
Year	AUMs	AUMs	AUMs	AUMs	AUMs	AUMs	AUMs	AUMs
2013	1,033	656*	2,132	1,165*	37*	155*	825*	156*
2012	671	656*	2,342	1,664*	37*	110*	743*	141*
2011	1,010	656*	2,368	1,053*	37*	207*	717*	286*
2010	1,148	630	2,477	1,662*	37*	880	501	No Data
2009	931	593	2,333	2,004*	37*	1002	428	187
2008	1,106	492	2,531	No Data	37*	636	436	175
2007	1,082	639	1,090	1,669*	37*	888	415	234
2006	674	655	2,474	1,518*	37*	514	805	103
2005	756	645	1,883	1,651*	37*	584	761	298*
2004	1,387	659	2,212	1,283*	37*	518	738	217
2003	1,109	652	1,626	2,260*	37*	550	511	423
*** Billed use, not actual use was used since the actual use reports were missing.**								

Major Ecological Sites within the South Jiggs Complex

A key area is a relatively small portion of an allotment selected as a representative monitoring point for measuring change in vegetation or soil and the impacts of management. It is chosen because of its location, use, and value. It is assumed that key areas, will reflect the current management over similar important areas in the unit (Swanson el al. 2006). Table 1-3 depicts ecological site, dominant species and expected cover percentages.

An ecological site is a kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management (Holechek et al. 2010). An Ecological Site Description (ESD) is used to provide reference in the inventory, evaluation, and management of native vegetation communities. The ecological site of a key area is determined based on several factors including soils, topography, and the plant community.

Table 1-3. Major Ecological Sites within the South Jiggs Complex

Ecological Site	Dominant Species (from EDS)	Potential Shrub Cover	Potential Herbaceous Foliar Cover	Potential Bare Ground	Rock Fragments	Litter Cover	Soil Stability
024XY006NV Dry Floodplain	Basin wildrye, basin big sagebrush, black greasewood	---	---	± 35%	---	± 35%	4-6
025XY003NV Loamy Bottom 8-14" PZ	Basin wildrye	10%	›60%	± 20%	5%	± 80%	4-6
025XY010NV Steep South Slope	Idaho fescue	---	---	± 25%	---	35-50%	3-6
025XY012NV Loamy Slope 12-16" PZ	Idaho fescue, bluebunch wheatgrass, mountain big sagebrush, antelope bitterbrush	15-25%	± 40%	± 35%	± 25%	± 35%	3-6
025XY014NV Loamy 12-12" PZ	Big sagebrush, Bluebunch wheatgrass, Thurber's needlegrass	15-25%	± 40%	± 40%	± 35%	± 25%	3-6
025XY017NV	Low	20-30%	± 40%	± 40%	35%	± 25%	3-6

Ecological Site	Dominant Species (from EDS)	Potential Shrub Cover	Potential Herbaceous Foliar Cover	Potential Bare Ground	Rock Fragments	Litter Cover	Soil Stability
Claypan 12-16" PZ	sagebrush, Idaho fescue, Bluebunch wheatgrass						
025XY018 Claypan 10-12" PZ	Bluebunch wheatgrass, Thurber's needlegrass, low sagebrush	25-35%	± 40%	± 45%	35%	± 25%	3-6
025XY019NV Loamy 8-10" PZ	Wyoming big sagebrush, Bluebunch wheatgrass, Thurber's needlegrass	15-25%	≤ 8%	± 50%	± 35%	± 20%	3-6*
025XY025NV Chalky Knoll	Indian ricegrass, Wyoming big sagebrush, black sagebrush	---	---	± 40-50%	---	± 10-20%	3-6*
025XY027NV	Idaho fescue, basin big sagebrush	---	---	20-30%	---	20-40%	3-6
*** Areas of this site occurring on soils that have a physical crust will probably have stability values less than 3.**							

Interpreting Indicators of Rangeland Health

While collecting data in 2011, BLM personnel completed the seventeen questions on the Interpreting Indicators of Rangeland Health evaluation sheet at the key areas. These worksheets show none to slight departure from expected for all indicators at the key areas. The Interpreting Indicators of Rangeland Health are summarized in Table 1-4 by allotment.

Table 1-4. Interpreting Indicators of Rangeland Health by Allotment

Allotment	Year	Departure from Expected	Departure from Expected	Departure from Expected
		Soil and Site Stability	Hydrologic Function	Biotic Integrity
Achurra Seeding	2011	None to Slight	None to Slight	None to Slight
	2008	None to Slight	None to Slight	None to Slight
Corral Canyon Seeding	2011	None to Slight	None to Slight	None to Slight
Corta FFR	2012	None to Slight	None to Slight	Slight to Moderate
Lindsay Creek	2011	None to Slight	None to Slight	None to Slight
Little Porter	2011	None to Slight	None to Slight	None to Slight
Little Porter FFR	2012	None to Slight	None to Slight	None to Slight
Merkley-Zunino Seeding	2011	None to Slight	None to Slight	None to Slight
Mitchell Creek	2011	None to Slight	None to Slight	None to Slight
Pearl Creek	2011	None to Slight	None to Slight	None to Slight
Robinson Creek	2011	None to Slight	None to Slight	None to Slight
Robinson Mountain FFR	2012	None to Slight	None to Slight	None to Slight
Twin Creek East	2011	None to Slight	None to Slight	None to Slight
Twin Creek North	2011	None to Slight	None to Slight	None to Slight
Twin Creek South	2011	None to Slight	None to Slight	None to Slight

Point Cover Data

Foliar and ground cover were measured at Browne KA1, Lindsay Creek KA3, Little Porter native, Merkley-Zunino Seeding KA1, Pearl Creek KA1, Twin Creek North KA1 and Twin Creek South KA1 in 2011 using the point cover method, in which cover data were collected at 600 systematically located points within a key area (Swanson et al. 2006). This method quantifies soil cover, including vegetation, litter, rock, and biotic crusts. These variables can be related to wind and water erosion, and soil infiltration and percolation, and can be used to determine the ability of the site to resist and recover from degradation (Herrick et al., 2005). Live vegetation point cover data at each key area was interpreted within a general rangeland health framework and then compared to ESD data. For all key areas within the South Jiggs Complex where point cover data was collected bare ground percentages range from 27% to 59%, and litter ranges from 12% to 22%. The most dominate ecological site within the South Jiggs Complex is the Loamy 8-10" PZ which lists the potential bare ground to be ± 50% and ± 20% for litter. Point cover data is not a direct correlation to the potential shrub cover and potential herbaceous foliar cover that is described in the ecological site description since they are based on weight. These results are summarized in Table 1-5.

Table 1-5. Summary of Point Sampling Cover Data by Allotment

Allotment	Key Area	Year	Basal Cover	Canopy Cover	Total Vegetative Cover	Litter	Bare Ground	Rock	Cryptogrammic Crust
Browne	1	2011	4%	29%	33%	13%	46%	6%	0.17%
Lindsay Creek	3	2011	11%	7%	18%	24%	56%	1%	1%
Little Porter	Native	2011	5%	22%	27%	20%	54%	1%	6%
Merkley-Zunino Seeding	KA 01	2011	8%	13%	21%	22%	55%	0.1%	3%
Pearl Creek	1	2011	36%	24%	60%	12%	27%	1%	0%
Twin Creek North	01	2011	13%	11%	24%	14%	58%	2%	2%
Twin Creek South	01	2011	10%	9%	19%	22%	59%	0%	1%

Weight-Estimate Production Data

Weight-estimate production data determines the production at a site in relation to its site potential and from this information, ecological condition is determined. Production data is influenced by precipitation, species and timing. The weight-estimate production data are displayed in Table 1-6.

Table 1-6. Key Area Production Data by Allotment

Allotment	Key Area	Year	Lbs./acre
Achurra Seeding	West #2	2011	2,773
Browne	1	2005	3,496
	1	1999	1,817
	2	2011	3,768
	2	2008	595
	3	2011	3,342
Corral Canyon Seeding	1 (Seeding)	2011	887
Little Porter	1 (Native)	1986	440
		1993	2,072
		1994	1,257
		1986	565
	2 (Seeding)	1990	675
		1993	2,503
		2011	1,944
Merkley-Zunino Seeding	1	1993	2,106
		1994	1,703
Mitchell Creek	1 Elko Seeding	2011	2,004
		1999	1,192
		1994	1,823
		1993	1,402
	2 Belmont South	2011	2,619
		1999	956
		1993	619
	3 White Pine Seeding	2011	2,195
		1999	498
		1994	962
		1993	772
Pearl Creek	1	2011	2,418
		1987	976
Robinson Creek	1	1991	719
		1987	797
	2	1991	789
	3	1991	576
Robinson Mountain	1West	Unknown	728
	1 Rose North	2010	354
	1 Middle	2010	81
	1 Rose South	2010	1,794
Twin Creek East	2	1991	650
	3	1991	421
	4	1991	727

Community Composition

Community composition was measured by collecting production data at Achurra Seeding KA2, Browne KA1, Browne KA2, Browne KA3, Corral Canyon Seeding KA1, Little Porter KA1, Little Porter KA2, Merkley-Zunino Seeding KA1, Mitchell Creek KA1, Mitchell Creek KA2, Mitchell Creek KA3, Pearl Creek KA1, Robinson Creek KA1, Robinson Creek KA2, Robinson Creek KA3, Robinson Mountain KA1 North Rose, Robinson Mountain KA1 Middle, Robinson Mountain KA1 South Rose, Robinson Mountain KA1 West, and Twin Creek East KA4, using the double weight sampling method. Production is defined as the amount of aboveground air-dry biomass produced annually within a site. The double weight sampling method is a commonly used method for estimating production (BLM 1999a; Nevada Range Studies Task Group 1984). These data are summarized in Figures 1-2 through 1-20. For a plant code key, and common names please refer to Appendix D.

Achurra Seeding Allotment

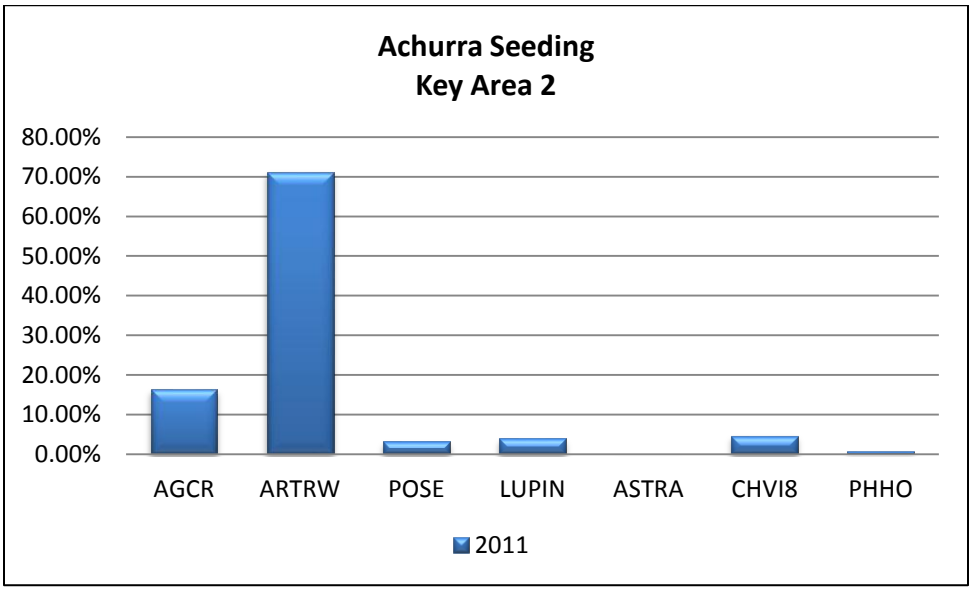

Figure 1-1. Achurra Seeding Key Area 2 Percent Composition

Production data was collected at KA-2 of the Achurra Seeding Allotment. The 2011 data shows this is a shrub dominated site with crested wheatgrass being the main contributor for the grass composition. This area was part of the type conversion and the shrub component is reestablishing.

Browne Allotment

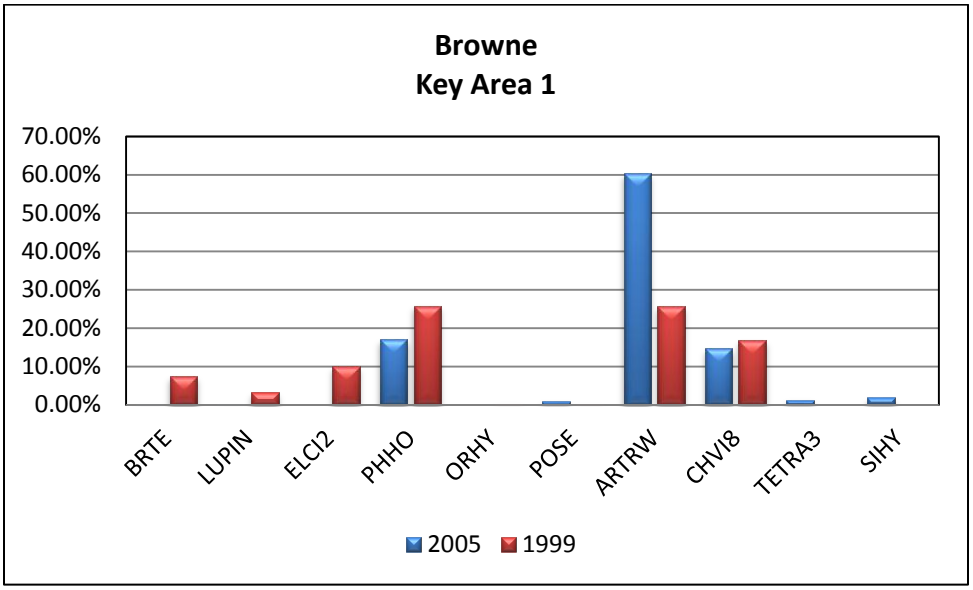

Figure 1-2. Browne Key Area 1 Percent Composition

The 2005 production data at KA-01 within the Browne Allotment shows a high shrub composition with a very low grass component at the site, compared to the data in 1999. In addition, there were no annual invasive grasses read in 2005 at KA-01 in 2005.

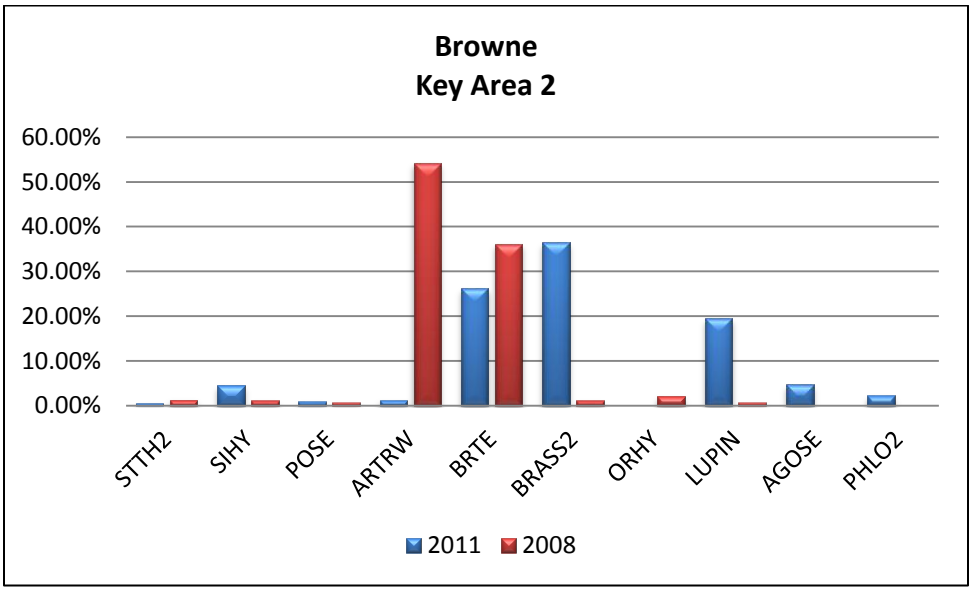

Figure 1-3. Browne Key Area 2 Percent Composition

Production data at KA-02 within the Brown Allotment indicates disturbance in the area. As compared to 2008, the 2011 data shows a severe loss in the perennial grass and shrub composition. Cheatgrass and mustard have mostly dominated the site between 2008 and 2011, due to the 1999 Sadler fire.

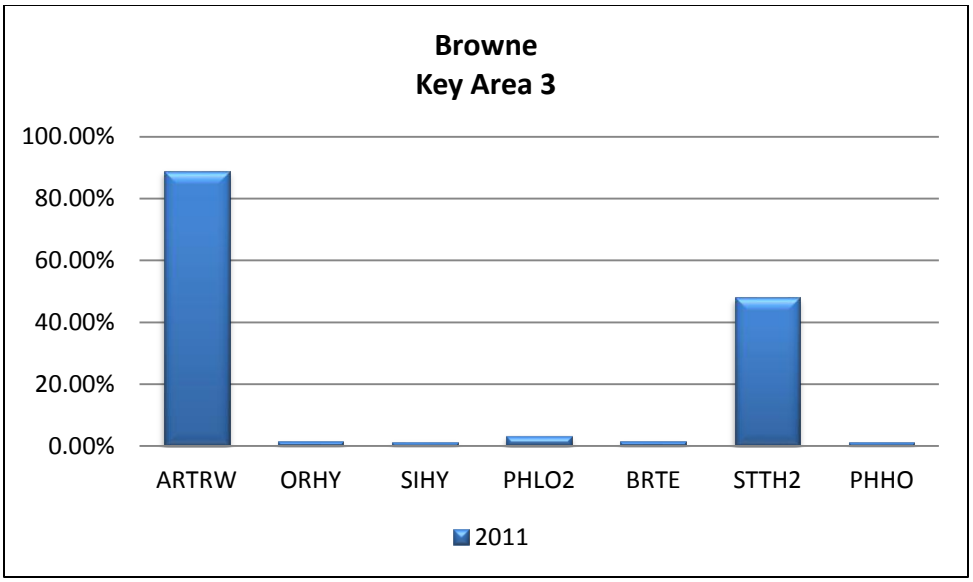

Figure 1-4. Browne Key Area 3 Percent Composition

Production data at KA-03 of the Browne Allotment collected in 2011, shows the site is dominated by Wyoming sagebrush and Thurber's needlegrass. Production data has only been collected in 2011 at KA-03 and will serve as baseline data for future trend studies.

Corral Canyon Seeding Allotment

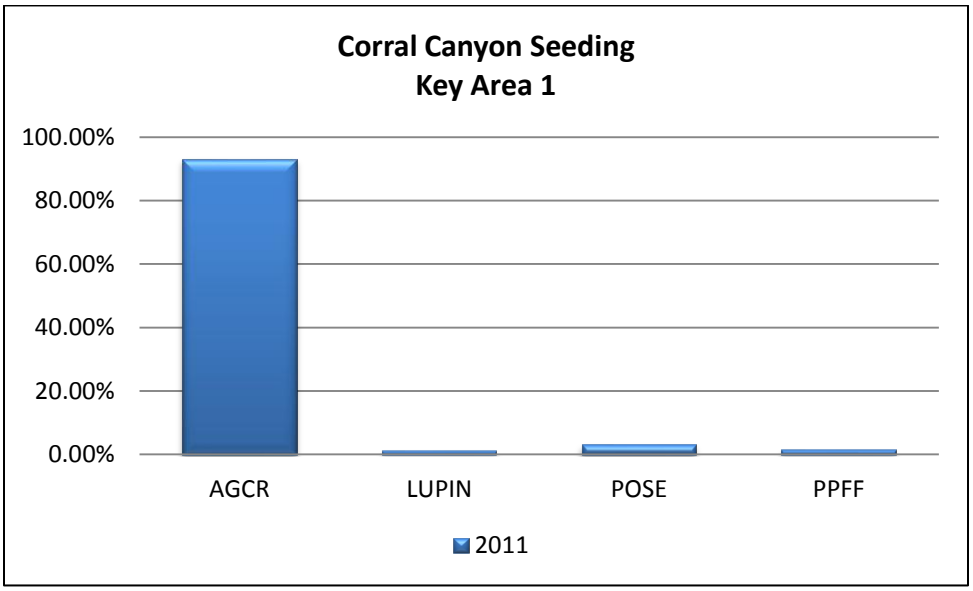

Figure 1-5. Corral Canyon Seeding Key Area 1 Percent Composition

Production data at KA-01 of the Corral Canyon Seeding shows that crested wheatgrass dominates the site's composition. Production data has only been collected in 2011 at KA-01 and will serve as baseline data for future tend studies. This area was part of the type conversion and the crested wheatgrass continues to me the dominant species.

Little Porter Allotment

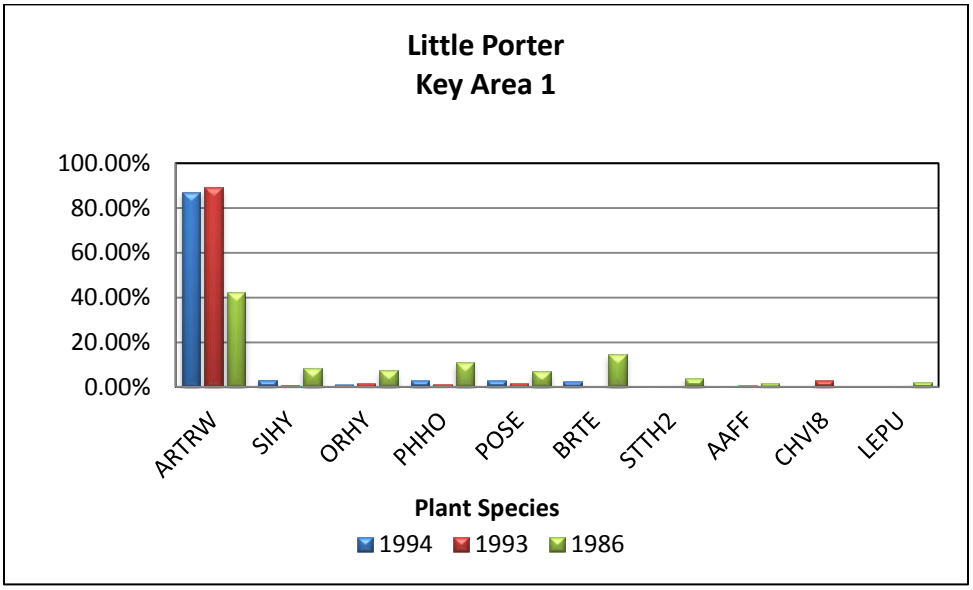

Figure 1-6. Little Porter Key Area 1 Percent Composition

Production data from 1986 to 1994 indicates that this site is mostly shrub composition with low components of grasses and forbs in the area.

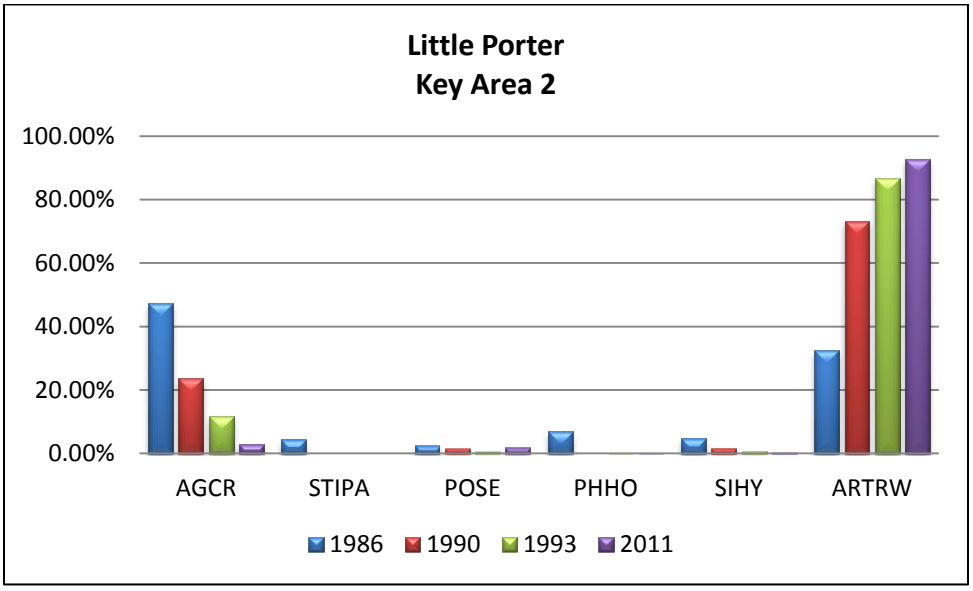

Figure 1-7. Little Porter Key Area 2 Percent Composition

Production data collected between 1986 and 2011, at KA-02 of the Little Porter Allotment, indicates that there has been a loss of grass component. However, there has been a consistent increase in shrub composition (ARTRW) throughout 1986 and 2011. This area was part of the type conversion and the shrub component is reestablishing.

Merkely-Zunino Seeding Allotment

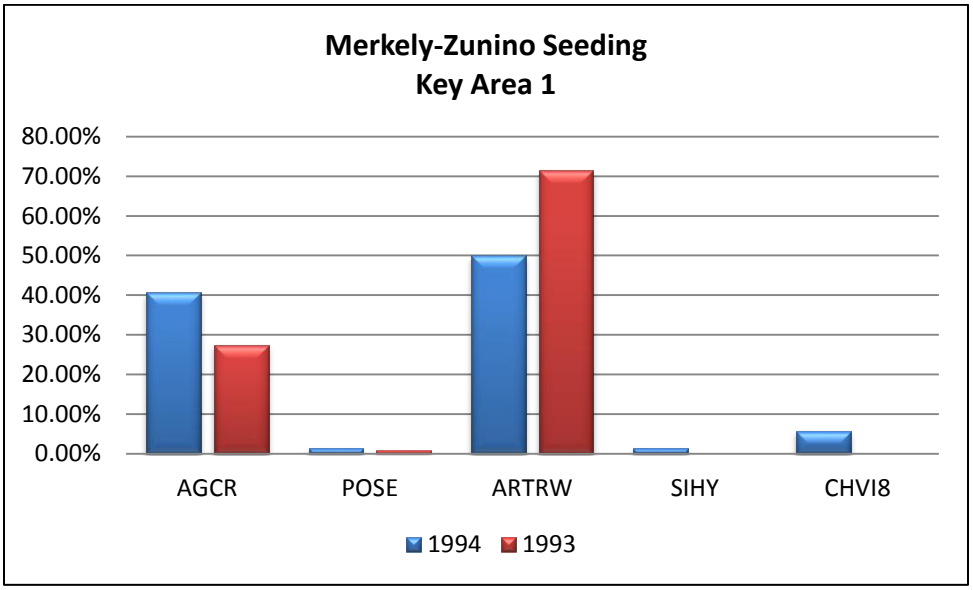

Figure 1-8. Merkley-Zunino Seeding Key Area 1 Percent Composition

Production data collected at KA-01 of the Merkely-Zunino Seeding shows a notable decrease in shrub composition, along with an increase in grass components between 1993 and 1994, the change is likely due to the production hoop placement, precipitation and timing of data collection.

Mitchell Creek Allotment

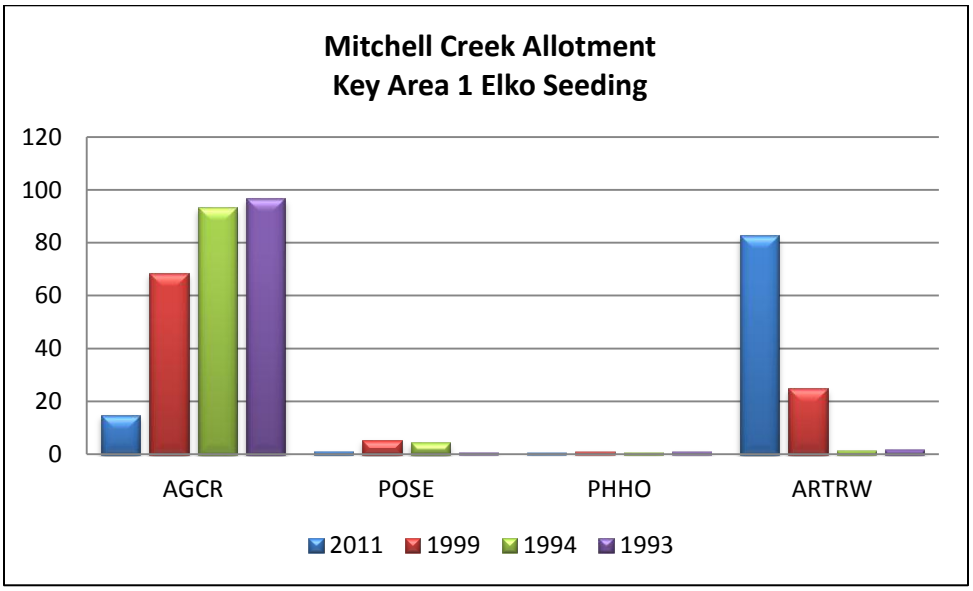

Figure 1-9. Mitchell Creek Elko Seeding Percent Composition

Production data from 1993 to 2011 for the Elko Seeding of Mitchell Creek Allotment shows a steady decrease in crested wheatgrass, along with a steady increase in sagebrush; of which, accounts for the

entire shrub component. This area was part of the type conversion and the shrub component is reestablishing.

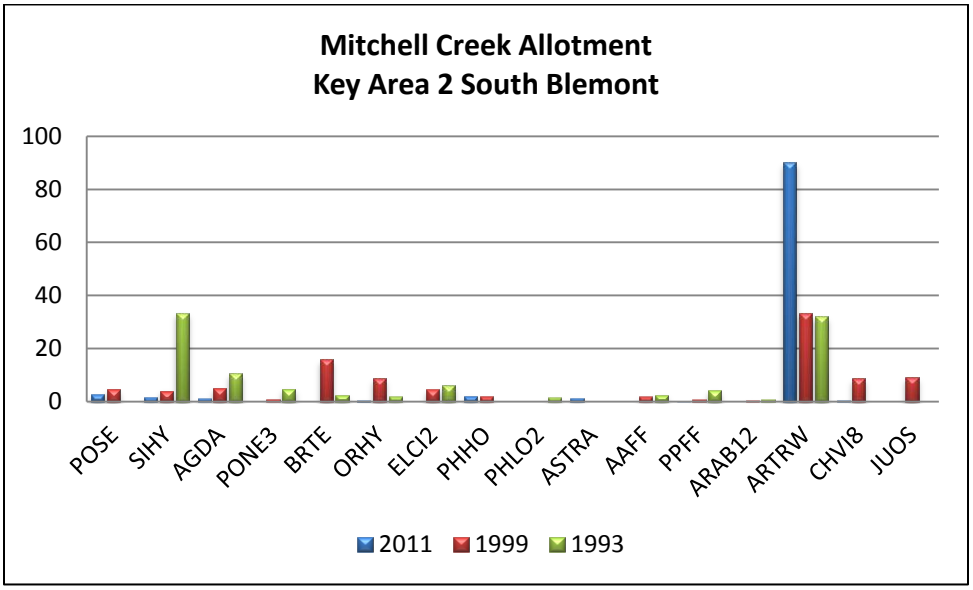

Figure 1-10. Mitchell Creek South Belmont Percent Composition

Production data collected between 1993 and 2011 at the South Belmont key area, of the Mitchell Creek Allotment shows a strong increase to the shrub component, along with a decrease in perennial grasses.

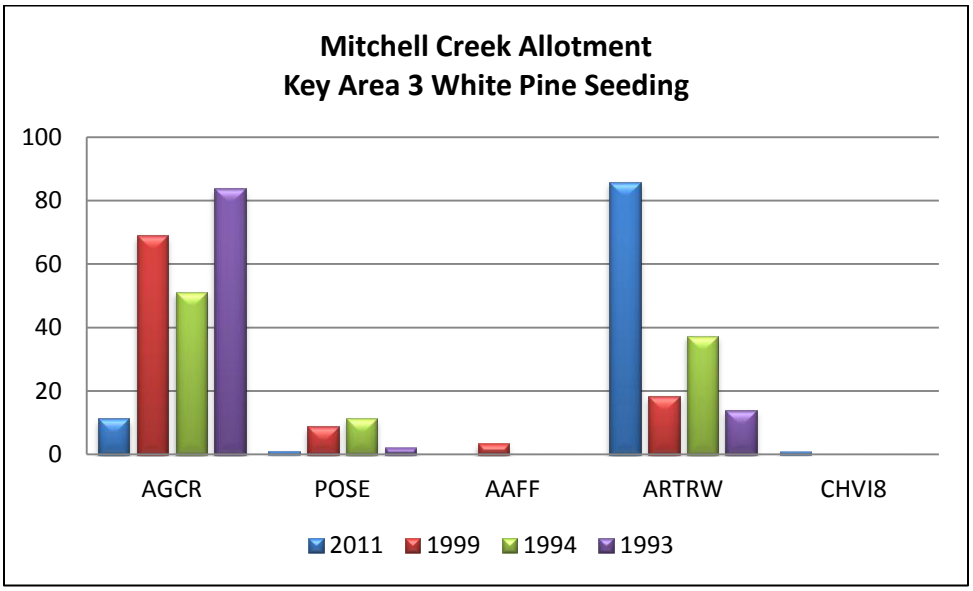

Figure 1-11. Mitchell Creek White Pine Seeding Percent Composition

Production data recorded between 1993 and 2011 at the White Pine Seeding key area of the Mitchell Creek Allotment shows a strong increase in shrub composition, along with a large decrease to the grass component. This area was part of the type conversion and the shrub component is reestablishing.

Pearl Creek Allotment

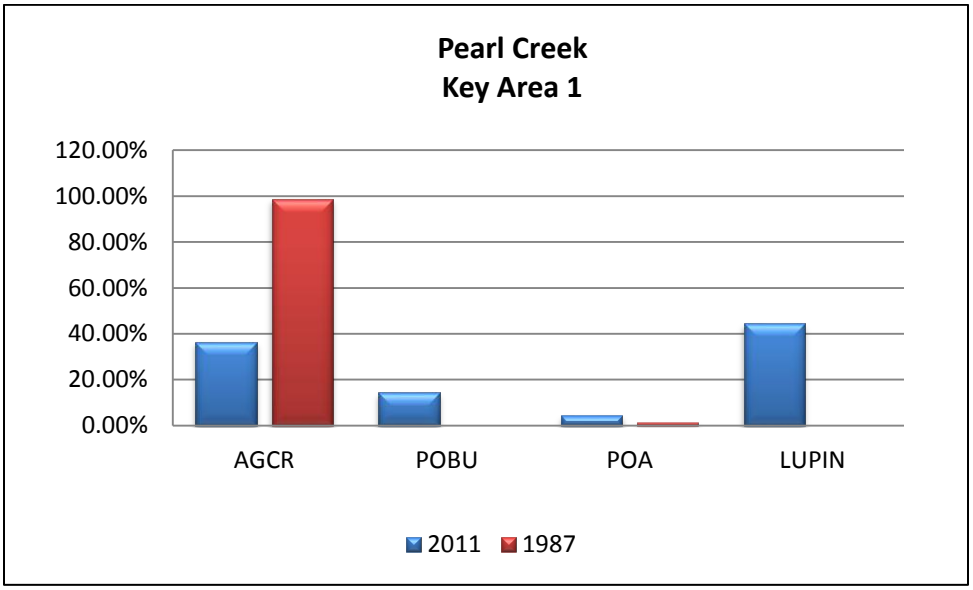

Figure 1-12. Pearl Creek Key Area 1 Percent Composition

Production data for KA-01 within the Pearl Creek Allotment, between 1987 and 2011, shows a large increase of crested wheatgrass; of which, dominates the site.

Robinson Creek Allotment

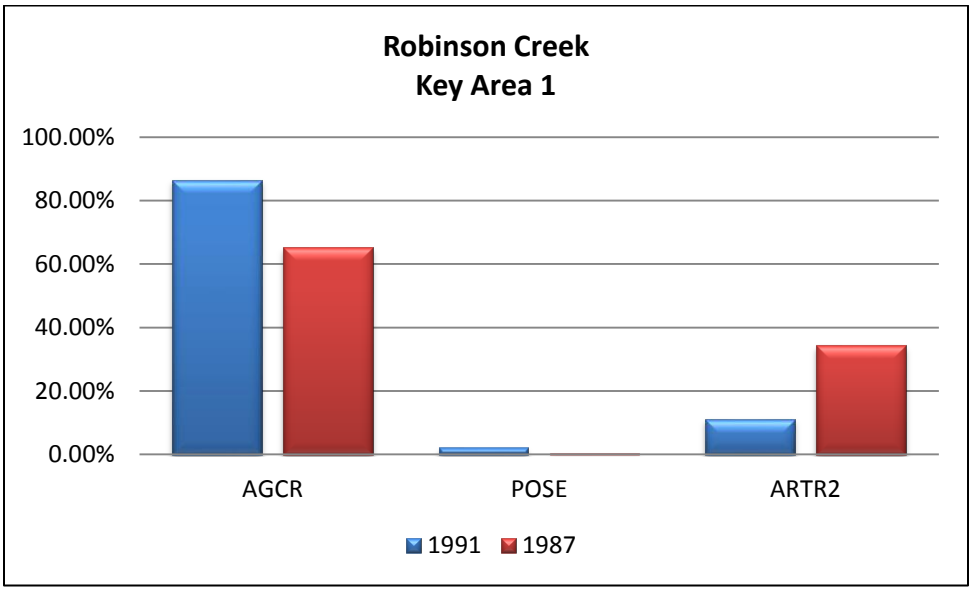

Figure 1-13. Robinson Creek Key Area 1 Percent Composition

Production data from 1987 to 1991 in KA-01 of the Robinson Creek Allotment shows an increase in the grass component, along with a decrease of shrub composition.

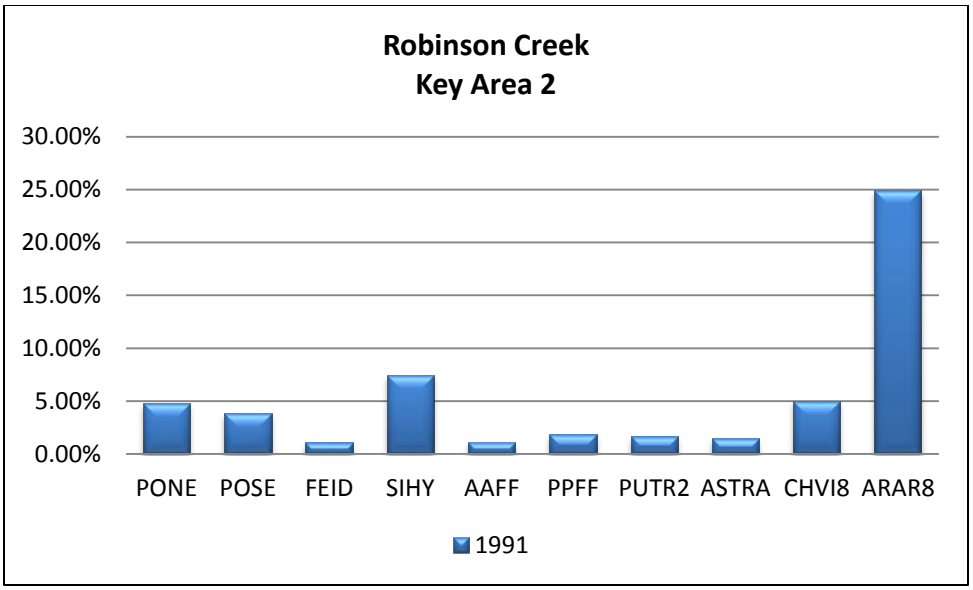

Figure 1-14. Robinson Creek Key Area 2 Percent Composition

Production data for KA-02 of the Robinson Creek Allotment was only collected in 1991 and shows the site is mostly dominated by shrubs and grasses. Production data collected in 1991 will be a baseline for future trend studies.

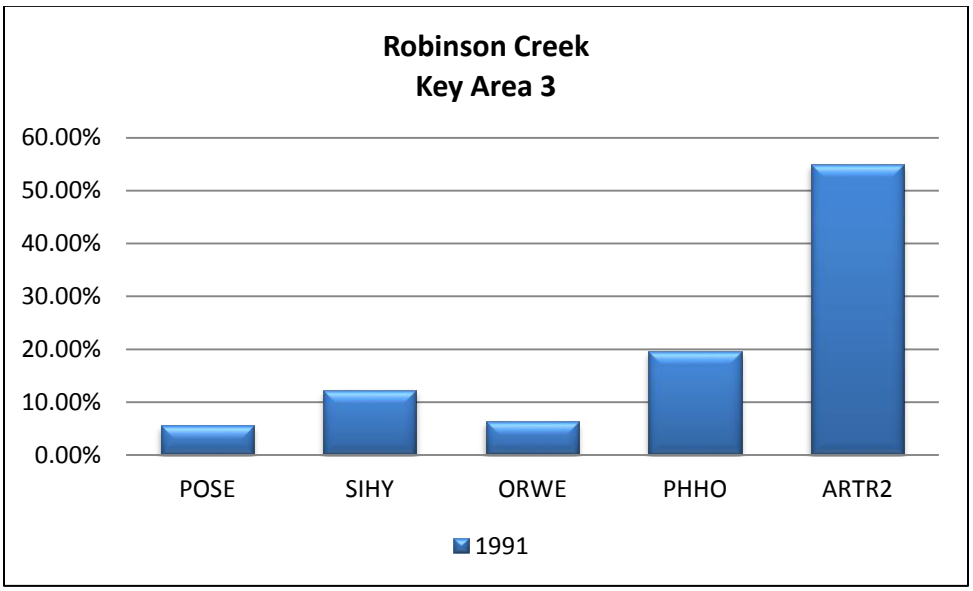

Figure 1-15. Robinson Creek Key Area 3 Percent Composition

Production data collected in 1991 at KA-03 of the Robinson Creek Allotment shows composition is fairly equal between grasses, forbs; along with, a greater shrub component. Production data collected in 1991 will be a baseline for future trend studies.

Robinson Mountain Allotment

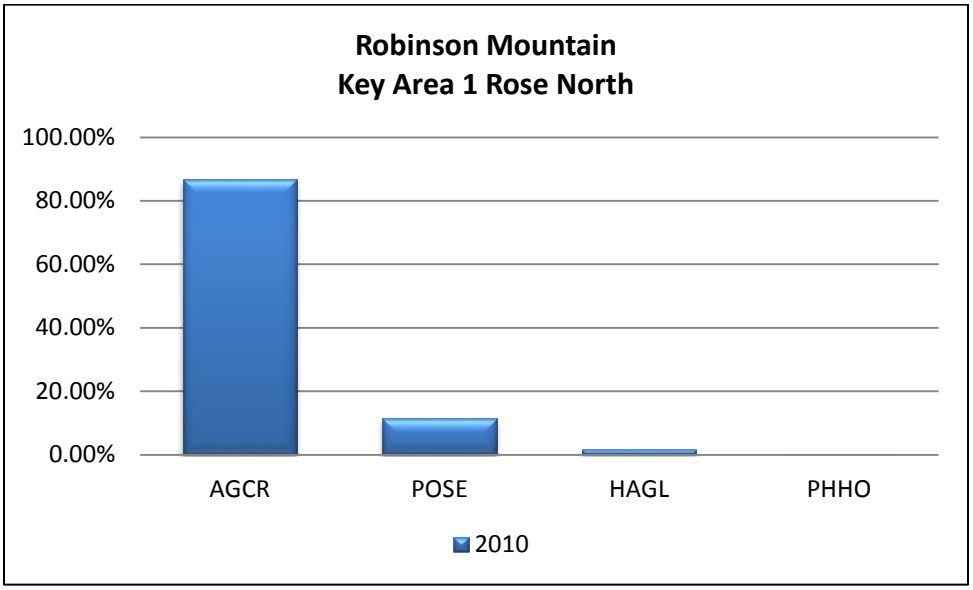

Figure 1-16. Robinson Mountain Key Area 1 Rose North Percent Composition

Production data collected in 2010 at the Rose North key area of the Robinson Mountain Allotment shows the site is dominated by crested wheatgrass, which is the main contributor to the grass composition. Production was only collected in 2010 and will be used as a baseline for future trend studies.

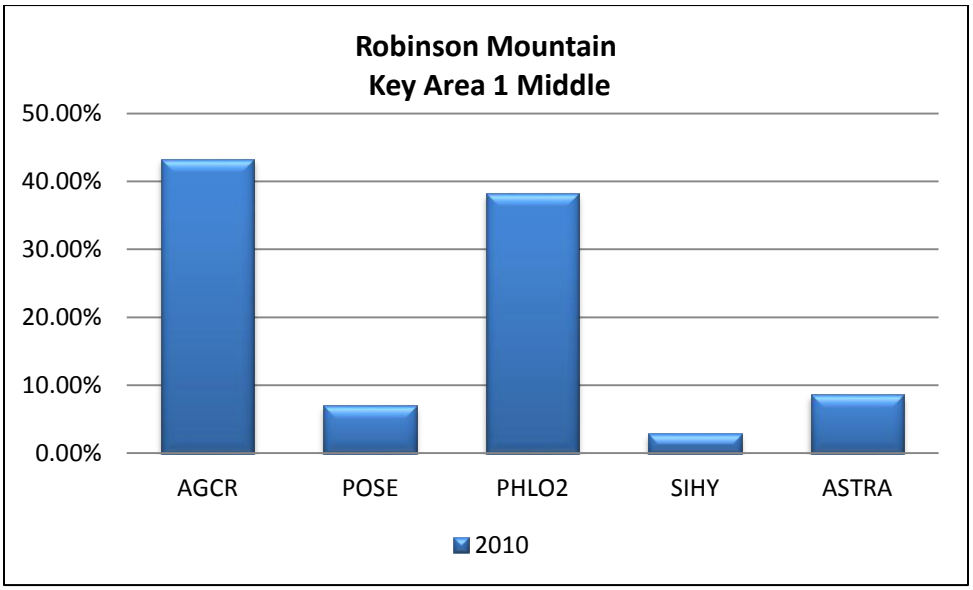

Figure 1-17. Robinson Mountain Key Area 1 Middle Percent Composition

Production data collected in 2010 at Robinson Mountain, Middle key area, shows the site is dominated by grasses and forbs, with no shrub composition recorded. Production data was only collected in 2010 and will serve as a baseline for future trend studies.

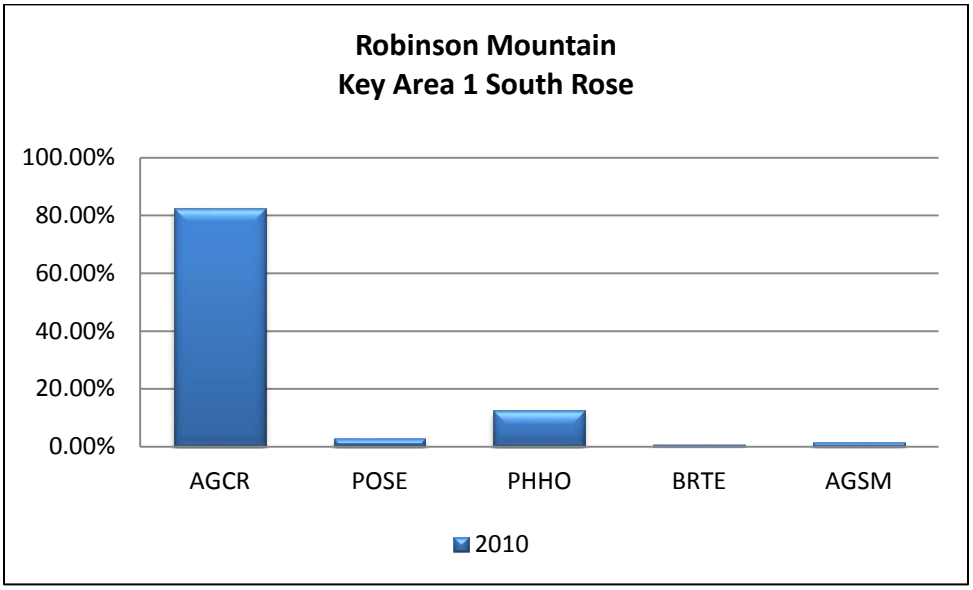

Figure 1-18. Robinson Mountain Key Area 1 Rose South Percent Composition

This Key area covers the year 2010. This area is nearly free of cheatgrass and has a high composition of AGCR. Production data was only collected in 2010 and will serve as a base line for future trend studies.

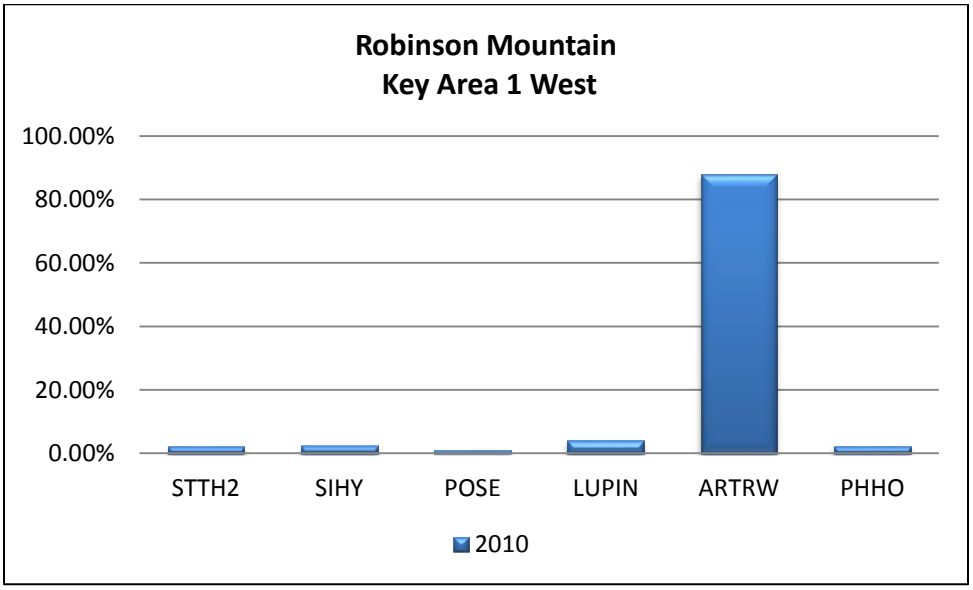

Figure 1-19. Robinson Mountain Key Area 1 West Percent Composition

Production data collected in 2010 for Robinson Mountain, key area 1-West, shows that this is a shrub dominated site, with very little grass and forb composition. Production data was only collected in 2010 and will serve as a base line for future trend studies.

Twin Creek East Allotment

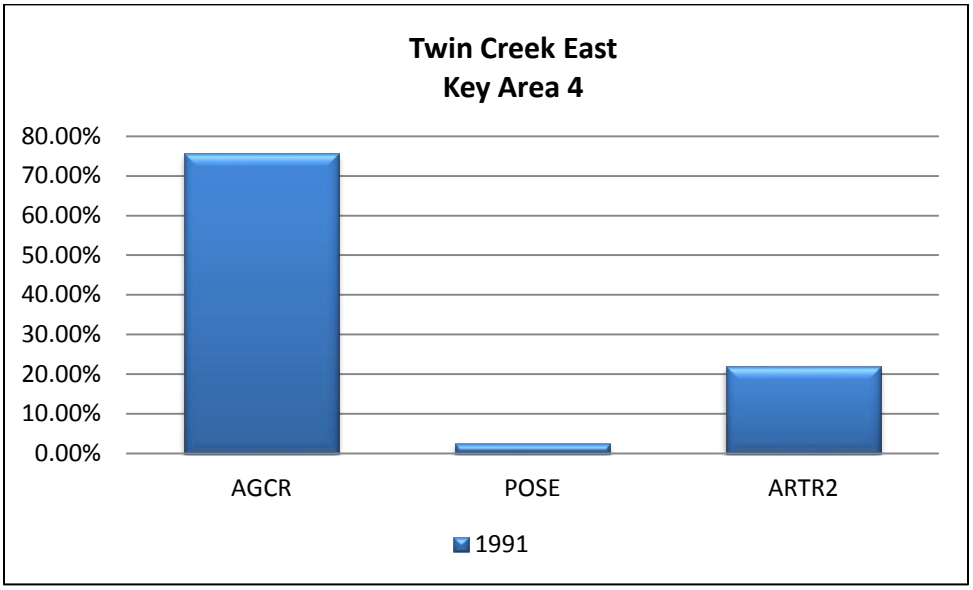

Figure 1-20. Twin Creek East Key Area 4 Percent Composition

Production data collected in 1991 at KA-04 of the Twin Creek East Allotment shows this is a grass dominated site, accompanied by some shrub composition. Production data was only collected in 1991 and serves as a base line for future trend studies.

Key Area Utilization

A key area is a relatively small portion of a pasture selected as a point to monitor change in vegetation or soil and the impacts of management. A key area is intended to reflect current management over similar important areas in the pasture. The BLM has established 26 key areas in the within the sixteen allotments covered by this document. Utilization is an estimation of the proportion of annual production consumed or destroyed by livestock or wildlife (BLM 1999b; Swanson et al. 2006). A summary of the annual utilization results for the allotments are displayed in Tables 1-7 through1-15. See Appendix B Map 1 for key area locations.

Table 1-7. Achurra Seeding Utilization

Year	Key Area	Species	Utilization Percentage
2011	1	AGCR	23.0%

Table 1-8. Browne Utilization

Year	Key Area	Species	Utilization Percentage	Species	Utilization Percentage
2009	1	ORHY	29.5%	STTH2	30.0%
2007	1	ORHY	29.0%	STTH2	21.6%
2006	1	SIHY	16.0%	STTH2	19.0%

Table 1-9. Lindsay Creek Utilization

Year	Key Area	Species	Utilization Percentage
2011	2	AGCR	22.0%

Table 1-10. Little Porter Utilization

Year	Key Area	Species	Utilization Percentage	Species	Utilization Percentage
2011	1	ORHY	19.0%	STTH2	31.3%
2011	2	AGCR	22.4%	No data	No data

Table 1-11. Merkley –Zunino Seeding Utilization

Year	Key Area	Species	Utilization Percentage
2011	1	AGCR	11.0%
2005	1	AGCR	29.0%

Table 1-12. Mitchell Creek Utilization

Year	Key Area	Species	Utilization Percentage
2011	1	AGCR	18.7%

Table 1-13. Pearl Creek Utilization

Year	Key Area	Species	Utilization Percentage
2011	2	AGCR	23.6%

Table 1-14. Robinson Mountain Utilization

Year	Key Area	Species	Utilization Percentage
2011	South Rose	AGCR	57%
2011	North Rose	ACGR	37%

Table 1-15. Twin Creek North Utilization

Year	Key Area	Species	Utilization Percentage
2011	1	AGCR	44.7%

Frequency

Frequency is the number of times a plant species is present in a given area. The concept of frequency refers to the uniformity of a species in its distribution over an area. Frequency data were collected within the South Jiggs Complex at key areas Browne KA1, Little Porter KA1, Pearl Creek KA1, Robinson Mountain KA1 and Twin Creek North KA1.

Browne Allotment

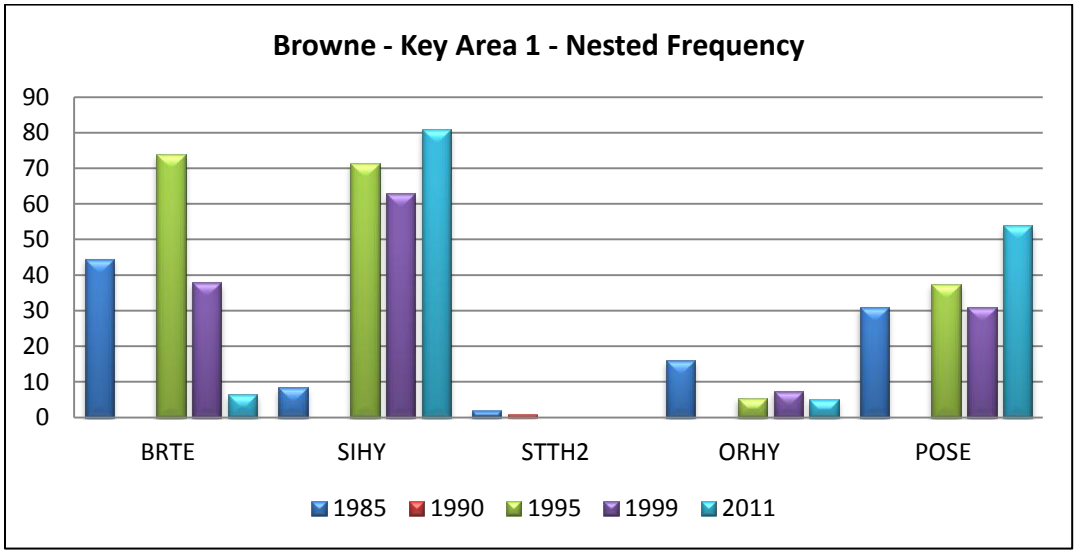

Figure 1-21. Percent Frequency of grasses, KA-1, Browne Allotment, 1985-2011

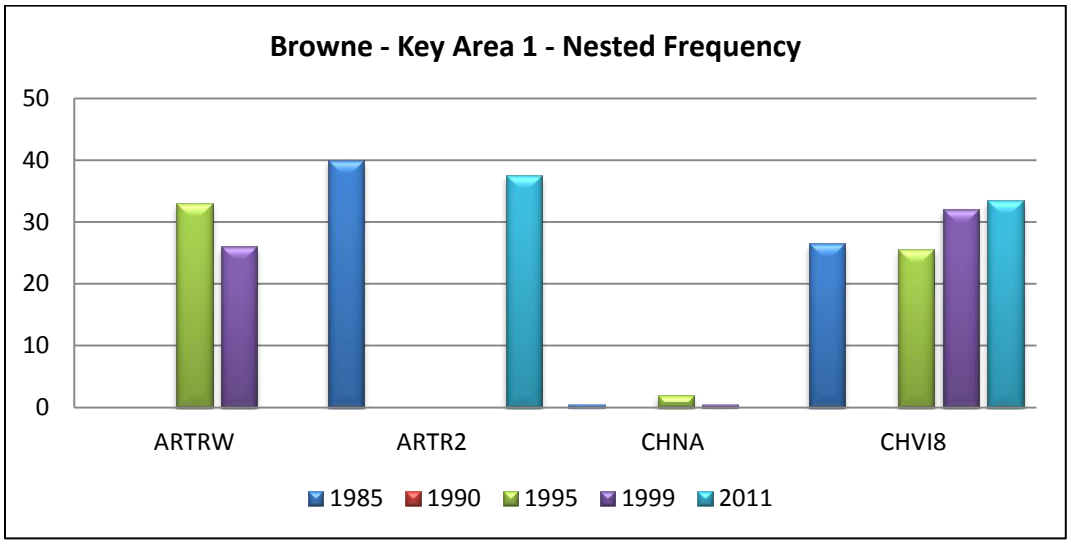

Figure 1-22. Percent Frequency of shrubs, KA-1, Browne Allotment, 1985-2011

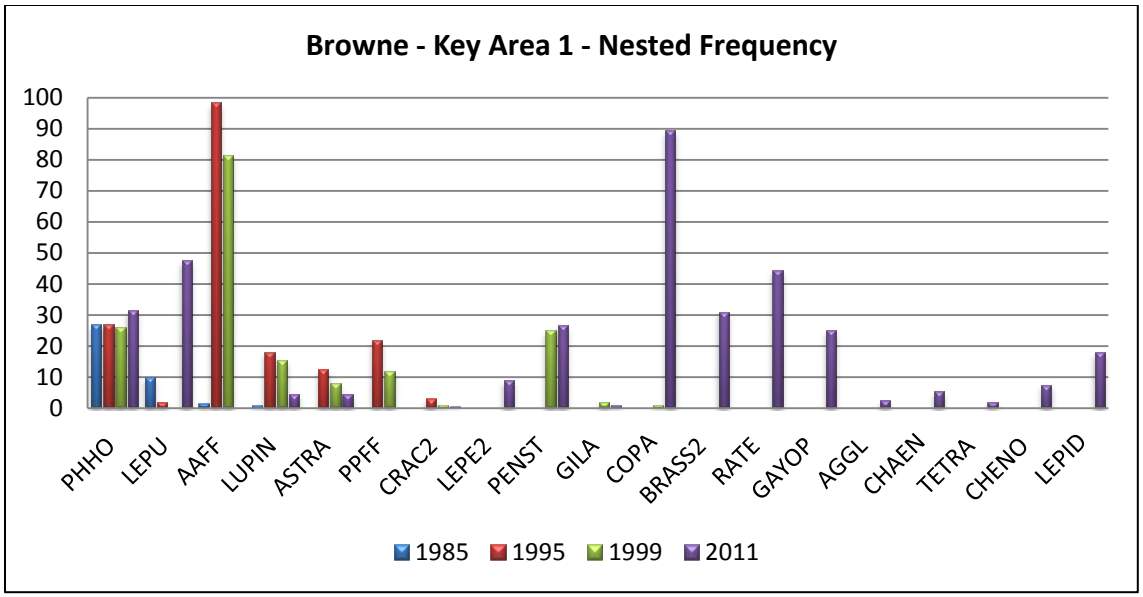

Figure 1-23. Percent Frequency of forbs, KA-1, Browne Allotment, 1985-2011

Frequency data was collected at key area 1 of the Browne Allotment. The data is displayed in Figures 1-21 through 1-23. Figure 1-21 shows that perennial grasses have been increasing. Figure 1-22 shows the shrub component has been static from 1985 to 2011. Figure 1-23 shows that a high diversity of forbs.

Little Porter Allotment

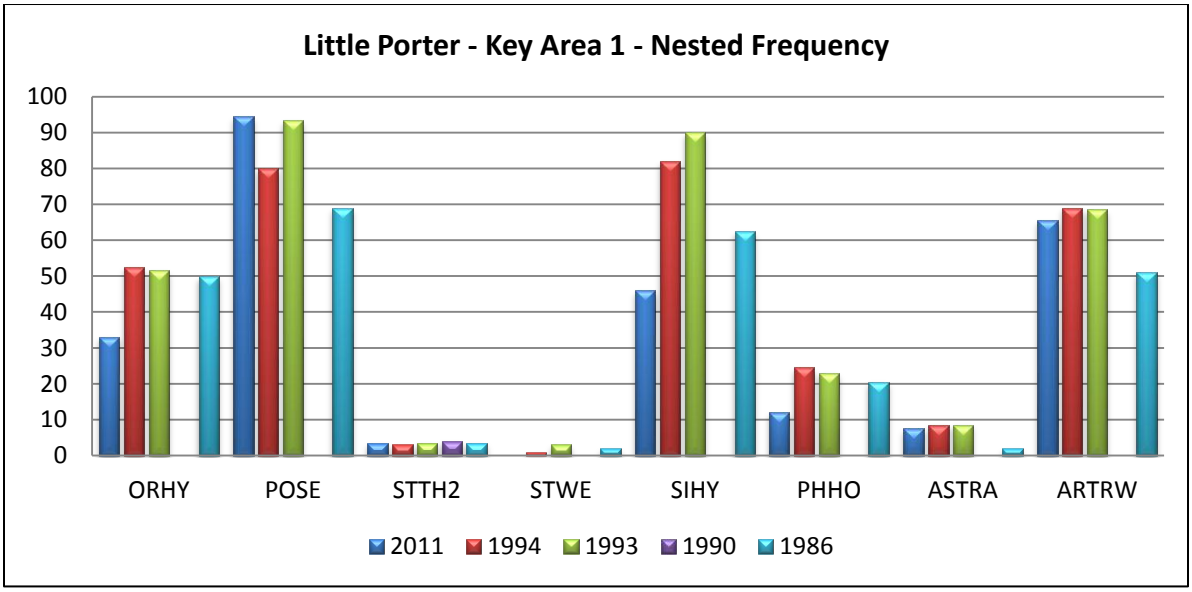

Figure 1-24. Percent Frequency of vegetation, KA-1, Little Porter Allotment, 1986-2011

Frequency data was collected for key area 1 of the Little Porter Allotment. The perennial grasses have shown some increase since 1986. The shrub component has only increased since 1986. The forb component has remained static since 1993.

Pearl Creek Allotment

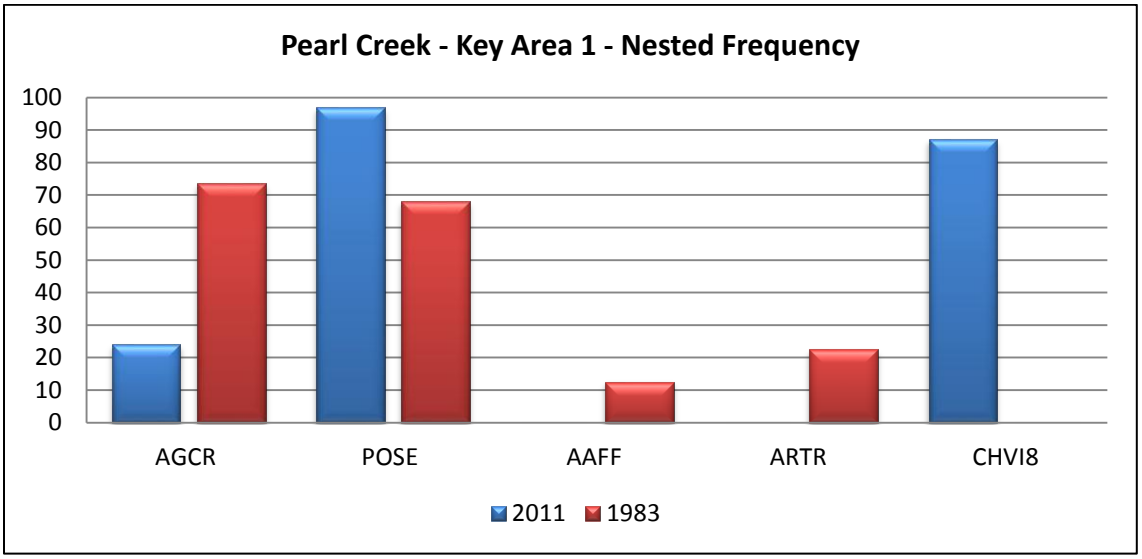

Figure 1-25. Percent Frequency of vegetation, KA-1, Pearl Creek Allotment, 1983, and 2011

Frequency data was collected at key area 1 for the Pearl Creek Allotment. The data shows an increase in POSE and a decrease in AGCR and an increase in CHVI8 between 1983 and 2011.

Robinson Mountain Allotment

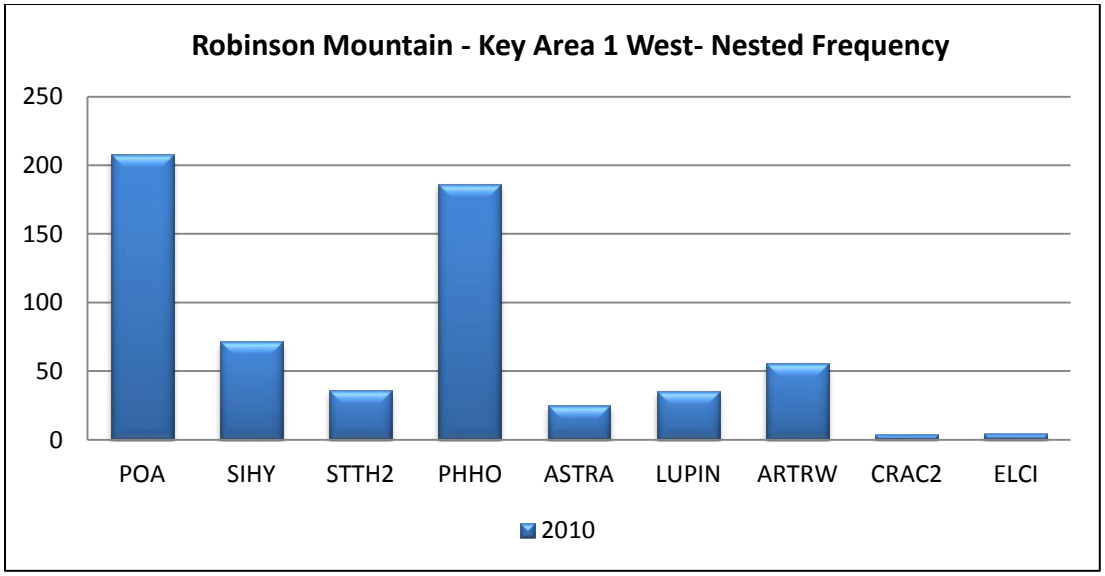

Figure 1-26. Percent Frequency of vegetation, KA-1, Robinson Mountain Allotment, 2010

Frequency data was collected at key area 1 west for the Robinson Mountain Allotment. Data shows this area is dominated by perennial grasses and forbs. Frequency data has only been collected in 2010 and this will serve as baseline data for future trend studies.

Twin Creek North Allotment

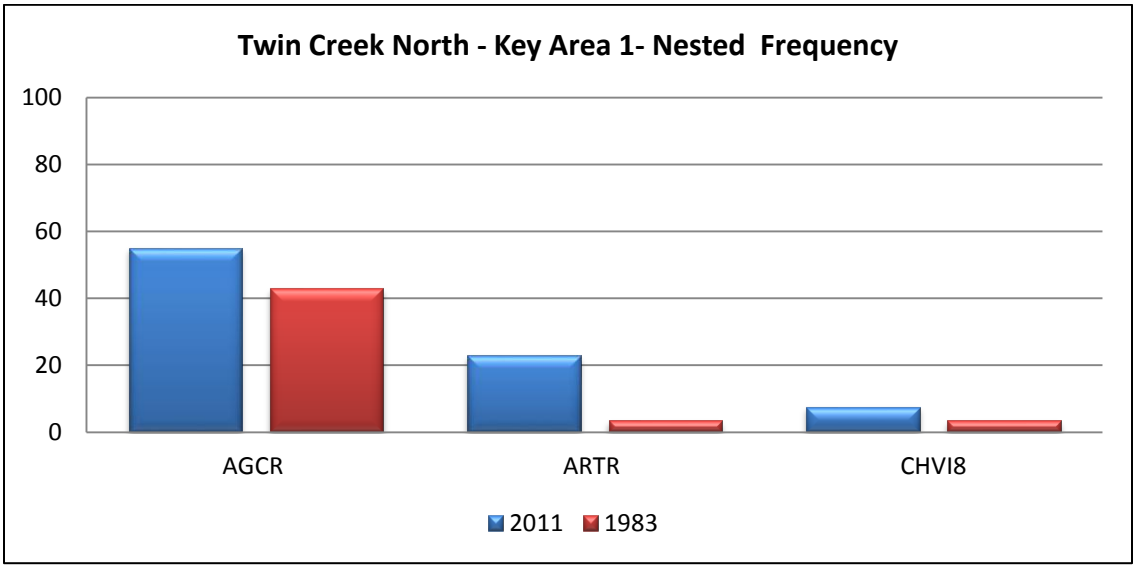

Figure 1-27. Percent Frequency of vegetation, KA-1, Twin Creek North Allotment, 1983 and, 2011

Frequency data was collected for key area 1 of the Twin Creek North Allotment. The site is dominated by AGCR with ARTR increasing since 1983.

Upland Photographic Data

Upland photographic data has been collected on the South Jiggs Complex from 1985 to 2011. The following photographs are a sample of what has been collected over the years.

Figure 1-28. Achurra Seeding KA-01 2011

Figure 1-29. Achurra KA-01 1991

Figure 1-30. Achurra KA-02 2011

Figure 1-31. Browne KA-01 2011

Figure 1-32. Browne KA-01 1999

Figure 1-33. Browne KA-02 2011

Figure 1-34. Browne KA-03 2011

Figure 1-35. Corral Canyon KA-01 2011

Figure 1-36. Corral Canyon KA-02 1988

Figure 1-37. Lindsay Creek KA-02 2011

Figure 1-38. Lindsay Creek KA-01 1988

Figure 1-39. Little Porter KA-01 2011

Figure 1-40. Little Porter KA-01 1993

Figure 1-41. Little Porter KA-02 2011

Figure 1-42. Little Porter KA-02 1993

Figure 1-43. Merkley –Zunino Seeding KA-01 2011

Figure 1-44. Merkley –Zunino Seeding KA-01 1993

Figure 1-45. Mitchell Creek KA-01 2011

Figure 1-46. Mitchell Creek KA-02 2011

Figure 1-47. Pearl Creek KA-01 2011

Figure 1-48. Pearl Creek KA-01 1987

Figure 1-49. Pearl Creek KA-02 2011

Figure 1-50. Pearl Creek KA-01 Seeding 2011

Figure 1-51. Robinson Creek KA-01 2011

Figure 1-52. Robinson Creek KA-01 1991

Figure 1-53. Robinson Creek KA-02 1991

Figure 1-54. Robinson Creek KA-03 2011

Figure 1-55. Robinson Creek KA-03 1988

Figure 1-56. Robinson Mountain KA-01 2011

Figure 1-57. Twin Creek East KA-01 2011 Figure 1-58. Twin Creek East KA-01 1991

Figures 1-59, 1-60 and 1-61. Twin Creek East KA-04 1991, KA-02 1991, and KA- 03 1991

Figure 1-62. Twin Creek North KA -01 2011

Figure 1-63. Twin Creek North KA-01 1985

Figure 1-64. Twin Creek South KA-01 2011

Figure 1-65. Twin Creek South KA-01 1988

Riparian and Wetland Habitat Data

Determinations of whether or not riparian and wetland sites occurring within the South Jiggs Complex are meeting the standard are based on proper functioning condition (PFC) assessments using standardized BLM protocols (Prichard et al. 1998, Prichard et al. 1999, Revised 2003). Definitions for PFC assessments are summarized in Appendix C. Where available, some additional data on stream and riparian habitat conditions collected as part of the Elko District's stream survey program (Elko District 2002) are included in the assessment. Only data collected on public lands are used for the determination. Flowing water riparian habitats are referred to as *lotic areas* and include both intermittent and perennial streams and in some cases, spring brooks (small drainages emanating from springs). Standing water riparian habitats are referred to as *lentic areas* and include seeps, springs and aspen stands. Monitoring and assessment locations are shown on Map 3. Riparian and wetland data by allotment are summarized in the following sections. Riparian and wetland data by allotment are summarized in the following sections.

Achurra Seeding Allotment

Riparian habitat is limited to a small partially intermittent drainage (referred to as Achurra Spring) located on the east side of the allotment and to short stretches of Huntington Creek serving as water gaps for livestock. The drainage includes remnants of an old development that is no longer functional although parts of the collection and pipe system may be acting to increase water availability for riparian plant growth. It is likely that an upstream collection system intercepted ground water and delivered it to the surface at the location of the trough (Figure 2-1, Rockwell 2013). What may have historically been subsurface flow is now water flowing on the surface at and below the trough. Although it is difficult to speculate how the drainage may have appeared prior to development and disturbance, it is possible that riparian habitat downstream from the trough may have expanded in response to the development.

Figure. 2-1. Achurra Spring (Achurra 01). Although the trough is no longer functional, water appears to be delivered to the area through an old pipeline and collection system installed several hundred yards upstream. November, 2013.

Results of functioning condition assessments completed for Achurra Spring (Achurra 01) in 2008 and 2013 indicate the site is functioning at risk, although trend is not apparent. Wetland plant species including Nebraska sedge and spikerush indicate presence of hydric conditions; however, trampling and compaction of soils by livestock is also causing alteration of drainage patterns and drying of areas that should support wetland vegetation (Figure 2-2). Trend is difficult to determine because of the altered capability and potential resulting from the development. In the absence of impacts from livestock, it is likely the area occupied by wetland plants would expand.

Observations of water gap areas along Huntington Creek show these areas were dry in November of 2013. Riparian vegetation was essentially nonexistent in these areas at the time of the assessment.

Figure 2-2. Archurra Spring (Achurra 01). November, 2013.

Browne Allotment

Riparian habitat located on public lands within the Browne Allotment is limited to several spring complexes including Brown Spring in the east pasture and a fairly expansive former meadow area in the west pasture. Much of the remaining riparian habitat is located mostly on private lands and includes a spring-fed drainage in the southern portion of the eastern pasture as well as small areas serving as water gaps along Huntington Creek. A pond in the northern corner of the eastern pasture on public land also provides a source of water for livestock. Generally, riparian habitat is very limited for the Browne Allotment (especially for the west pasture) causing livestock and wild horses to concentrate on limited water sources.

PFC assessments were completed by BLM for the two spring complexes located on public lands in the Browne Allotment (Table 2- 1).

Brown Spring was rated as being in PFC in 2011. The site was stable and well vegetated with sedges and rushes at the time of the assessment. Although this spring does not currently support a functional development, observations made during BLM's 1982 water resources inventory indicate the area was likely developed at one time.

The second site is highly degraded and occurs as a remnant of a once much larger meadow complex. The site was rated as functioning-at-risk with a downward trend in 1995 and non-functional in 2013. Surface and subsurface flow patterns have been severely altered as evidenced by excessive "hummocking" (Figure 2-3). Hummocking is the result of abnormal frost heaving, a process in which formation of ice lenses causing soil to be pushed upward as a result of high levels of trampling and compaction. Consequences of hummocking including drying and loss of riparian and wetland plant species, were documented for this site during the 1995 and 2013 assessments. In addition to high levels of trampling by cattle and wild horses, heavy to severe use of herbaceous vegetation by both cattle and wild horses was observed during a site visit in 2012 and during the PFC assessment in 2013.

Table 2-1. Riparian Functioning Condition Assessments for the Browne Allotment.

Monitoring Site	Identification Number	Year		
		1995	2011	2013
Brown Spring (East Pasture)	Brown 01	No data	Proper functioning condition	No data
Former Meadow Complex (West Pasture)	Brown 02	Functional-at-risk, downward trend	No data	Non-functional

Figure 2-3. Brown 02 showing drying and excessive "hummocking". September, 2012.

Lindsay Creek Allotment

Only very limited amounts of riparian habitat occur along Brown, Lindsay, Mitchell and Pearl Creeks located within the Lindsay Creek. With the exception of Pearl Creek, all three remaining streams reaches have been determined to be intermittent in recent years. Although Pearl Creek is a perennial

stream (flows were lacking in 2013 as a result of drought), most of Pearl Creek is included within exclosures in the adjacent Pearl Creek Allotment. In addition, Cass House Spring, located in the adjoining Mitchell Creek Allotment, flows for about a distance of 100 yards into the Lindsay Creek Allotment. Riparian vegetation along this drainage-way is limited.

Brown Creek is identified as a potential Lahontan cutthroat trout (LCT) reintroduction stream in the 1995 LCT Recovery Plan (Coffin and Cowan 1995). However, presence of brook trout on Forest Service lands upstream and lack of suitable habitat conditions on BLM administered lands make it unlikely LCT would ever become established within the Lindsay Creek Allotment. Brook trout are highly competitive with native cutthroat and are difficult to eradicate. In 2002, BLM rated Brown Creek as non-functional primarily as a result of a lack of vegetative attributes required for energy dissipation and soil stabilization. Riparian and wetland species were almost completely lacking while streambanks were comprised almost entirely of upland or facultative plants including sagebrush (*Artemisia tridentata*), Kentucky bluegrass, wild rose and forb species associated with disturbance (Figure 2-4). Livestock impacts in the form of heavy use of streamside vegetation, streambank trampling and trailing were noted throughout the reach.

Although Brown Creek was observed to be flowing below the Forest Service Boundary in 2002, it was determined to be intermittent on BLM administered lands in 2013. Historically, this stream was likely more perennial in nature. Remnants of mesic meadows which once functioned as floodplains are evident in Figure 2-4. Channel incision and associated lowering of the water table as well as reduced infiltration from soil compaction and loss of riparian plants are factors contributing to the decline in the ability of Brown Creek to store and capture water. Recent drought conditions are also clearly exacerbating this situation.

Figure 2-4. Brown Creek, approximately one mile downstream from U.S. Forest Service boundary. Note meadow remnants on terraces which historically functioned as floodplains. August, 2002.

The portion of Lindsay Creek within the Lindsay Creek Allotment was documented as intermittent in both 2002 and 2013 with little or no riparian vegetation. This reach appears to flow only in response to snowmelt or precipitation events.

Approximately one mile of the very lower reaches of Mitchell Creek is included within the Lindsay Creek Allotment. Although LCT were reintroduced into Mitchell Creek in the 1970's, this species is thought to have extirpated from the stream by the 1990's (refer to the discussion for the Mitchell Creek Allotment). Stream surveys conducted on Mitchell Creek by BLM between 1985 and 2013 show the portion occurring within the Lindsay Creek allotment has been consistently intermittent.

Only a very limited portion of Pearl Creek occurs in the Lindsay Creek Allotment where it serves as a water gap for livestock. Although riparian habitat conditions are poor, a single age class of cottonwood suckers has grown beyond the reach of grazing and will likely be able to replace the existing stand of mature cottonwood trees in that area.

Mitchell Creek Allotment

Riparian and wetland habitats on public lands within the Mitchell Creek Allotment are limited to several springs and to intermittent portions of drainages which originate on the west side of the Ruby Mountains. Although topographic maps show an additional spring along the western boundary of the allotment (adjacent to Forest Service lands), this spring could not be located during field inspections in 2013. Portions of Mitchell and Sherman Creeks drain into the Mitchell Creek Allotment from adjoining U.S. Forest Service lands; however, these drainages are currently intermittent. Most of the spring habitats on the Mitchell Creek Allotment are associated with old water development projects which are no longer functional. Available information for lotic and lentic riparian habitats is summarized below.

Lotic Riparian Habitat

Mitchell Creek is identified as supporting Lahontan cutthroat trout (LCT) in the 1995 LCT Recovery Plan (Coffin and Cowan 1995). Both LCT and non-native brook and brown trout were stocked in Mitchell Creek in the early to mid-1900's, although LCT fingerlings were planted on Forest Service lands in 1970 (BLM and Nevada Department of Wildlife files). Although both brown trout and LCT were documented in Mitchell Creek on BLM lands in 1985, only nongame species including suckers and Lahontan speckled dace were found in this same area during a 1998 survey (Nevada Department of Wildlife files). No fish of any kind were found on Forest Services lands during the 1998 survey. No additional surveys have been conducted on either Forest or BLM lands since that time (Elliot 2013).

Stream surveys or assessments conducted by BLM for the Mitchell Creek Allotment between 1985 and 2013 show riparian habitat conditions have consistently been poor and are limited by lack of perennial streamflow (Table 2-2, Figures 2- 5 through 2-8). In 1985, the stream was flowing in June and still had access to a small floodplain, although the riparian plant species present are indicative of a history of heavy grazing as well as declining soil moisture levels. In subsequent years, the stream appears consistently intermittent (plants visible in the 2000 photo are upland species growing in response to seasonal moisture). Poor riparian habitat condition ratings are the result of unstable streambanks and a lack of streambank cover. Where functioning condition assessments were completed, factors including shrinking and drying of the riparian area, channel entrenchment and associated straightening (gullying), lack of riparian species, lack of perennial flow and excessive sedimentation were cited as factors preventing the stream from functioning properly. By 2013, it was determined that functioning condition

assessment and stream survey protocols may not be applicable due to Mitchell Creek because of the intermittent nature of this stream.

Table 2-2. Summary of habitat assessments for Mitchell Creek in the Mitchell Creek Allotment. Data are from stream survey stations S-05 through S-09

Year	Riparian Condition Class (% of optimum)[1]	Functioning Condition Assessment
1985	38 (poor)	No data
1991	33 (poor)	No data
2000	46 (poor)	Functional-at-risk, downward trend (area of S-05 only)
2013	26 (poor to not applicable)	Non-functional to not applicable

[1]Average of streambank cover and streambank stability. Optimum is defined as totally stable streambanks well vegetated by trees or tall shrubs.

Figures 2- 5 and 2-6. Mitchell Creek, S-06, T-1, downstream. Left: June, 1985; Right: August, 1991.

Figures 2-7 and 2-8. Mitchell Creek, S-06, T-1, downstream. Left: July 2000; Right: April, 1991.

A combination of climatic factors as well as a loss of storage capacity are likely factors contributing to the poor habitat conditions and intermittent nature of Mitchell Creek within the Mitchell Creek

Allotment. Two of the four streams survey years (1991 and 2013) were exceptionally dry and even consistently perennial streams lost baseflows. In addition, past and current grazing practices are resulting in accelerated rates of erosion as well as reduced capacity of floodplain areas to store and capture spring runoff. Chronic overuse of riparian plants species as well as trampling and compaction of soils in riparian areas can result in accelerated erosion, lowered water tables, reduced infiltration, higher peak flows and loss of late summer and fall water (Belsky et al. 1999). Some of these processes are visible in Figures 2-9 and 2-10. Figure 2-9 shows drying of a historic meadow area as evidenced by a predominance of facultative and upland plant species in an area that likely supported sedges and rushes at one time. Figure 2-11 illustrates the effects of reduced infiltration combined with concentrated stream flows resulting in formation of a gully and draining of what were likely historic meadow areas.

Figures 2-9 and 2-10. Left: Mitchell Creek, S-09, T-1, upstream. April 2013; Right: Mitchell Creek, S-08, T-1 upstream. April, 2013.

Lentic Riparian Habitat

Functioning condition assessments were completed for three springs in the Mitchell Creek Allotment in 2011. All three springs were rated as functioning-at-risk with a downward trend (Table 2-3). Shrinking and drying of the riparian area, loss of riparian and wetland plant species and alteration of drainage patterns as a result of trampling and compaction by livestock were cited as reasons these areas are not functioning properly. In the case of Cass House Spring, an old non-operational development is contributing to draining and drying of the riparian area. Photographic comparisons of this spring between 1982 and 2013 illustrate drying and loss of riparian function (Figures 2-11 through 2-16). Although most of Belmont Spring including an associated drainage along Mitchell Creek is located on private land, the fenced source occurs on public lands. A visual inspection of this area in 2013 shows that the spring source is fairly well vegetated but function may be affected by an old collection system.

Table 2-3. Summary of 2011 functioning condition assessments for Mitchell Creek Allotment.

Spring Name	Number	Rating
Cass House Spring	Mitchell Creek 01	Functional-at-risk, downward trend
Hellman Springs #1	Mitchell Creek 02	Functional-at-risk, downward trend
Hellman Springs #2	Mitchell Creek 03	Functional-at-risk, downward trend

Figures 2-11 and 2-12. Cass House Spring (Mitchell 01), Mitchell Creek Allotment. Left: July 9, 1982; Right: August 8, 2011.

Figure 2-13. Cass House Spring, Mitchell Creek Allotment. April, 2013.

Pearl Creek Allotment

Riparian habitat on public land within the Pearl Creek Allotment occurs along about 1.2 miles of Pearl Creek. About 85% of Pearl Creek in this allotment is included within a series of five exclosures, three of which were constructed in the 1980's and two of which were added to existing exclosures in 2005 to reduce the size of the water gaps. Currently, one water gap serves the adjoining Lindsay Creek Allotment, while two water gaps along the perennial portion of Pearl Creek provide livestock water for the Pearl Creek Allotment. The portion of Pearl Creek below the downstream most exclosure is consistently intermittent. Woven wire was added to some of the exclosure segments in an effort to dissuade beaver from cutting mature cottonwoods; however, this type of fencing has been shown to not be effective against beaver on other parts of the district.

Pearl Creek supports both LCT and brook trout. Both these two species as well as rainbow trout were historically stocked into Pearl Creek, although only LCT and brook trout are still present. Beginning in 2006, the Nevada Department of Wildlife implemented an intensive brook trout removal program in an effort to reduce impacts from this non-native species on the native LCT. Brook trout are highly competitive with LCT and are a major cause of decline of this species over its historic range. Overall, the

brook trout removal program (accomplished by electroshocking) is effective and LCT populations now exceed brook trout populations (Elliot 2013).

Although BLM has conducted numerous stream habitat surveys on Pearl Creek since 1980, changes in exclosure configurations have made it difficult to compare data overtime. However, data collected in 2011 and 2013 are assumed to be representative of current conditions (Table 4). Based on surveys conducted in 2013, riparian habitat conditions within exclosures are fair to good as a result of regeneration of cottonwood, aspen and willow. Although some areas of unstable streambanks and channel downcutting were documented, entrenchment is a somewhat natural condition for this channel type. Pearl Creek represents a Rosgen "A4" channel type based on its relatively steep gradient (over 5%) and its gravel streambed. Rosgen A4 channels are characterized by high energy streamflows and naturally unstable streambanks with resulting entrenchment (Rosgen 1996). Channel entrenchment was cited as a factor in the functional-at-risk rating recorded for 2011, although trend was determined to be upward.

Generally, the exclosures have been effective in allowing for recovery and improvement of Pearl Creek on BLM lands as evidenced by regeneration and replacement of remnant stands of mature cottonwood and aspen (Figure 2-14). Although habitat conditions are poor in water gap areas as a result of livestock grazing, impacted areas are limited in size. In November of 2013, Pearl Creek was documented to be almost completely dry over most of its length on BLM administered lands as a result of a second year of severe drought conditions.

Table 2-4. Summary of current stream and riparian habitat conditions for Pearl Creek in the Pearl Creek Allotment. Data were collected in 2013 from stream survey stations S-01 through S-03.

Riparian Condition Class (% optimum)[1]		**Functioning Condition Assessment (exclosures)[2]**
Inside Exclosures	Outside Exclosures (water gaps)	
59 (fair to good)	35 (poor)	Functional-at-risk, upward trend

[1]Average of streambank cover and streambank stability. Optimum is defined as totally stable streambanks well vegetated by trees or tall shrubs. Data are from S-01 through S-03 and were collected in 2013.

[2]Data are from 2011.

Figure 2-14. Aspen regeneration along Pearl Creek in the lower-most exclosure in the Pearl Creek Allotment. November, 2013.

Robinson Creek Allotment

Riparian habitat in the Robinson Creek Allotment include the South Fork of Robinson Creek as well as numerous seeps and springs in the higher elevations. Several wells and reservoirs are present in the lower elevations, while scattered pockets of aspen occur in the more mountainous areas. Significant portions of the South Fork of Robinson Creek in the Robinson Creek Allotment are intermittent.

Lotic Riparian Habitats

Results of functioning conditions assessments conducted for lotic areas within the Robinson Creek Allotment in 2011 and 2013 are variable (Table 5). Assessed portions of the South Fork of Robinson Creek (including 1.7 miles) were rated as being non-functional or functional-at-risk, with a downward trend in 2013. In 2011, small segments of spring-fed drainages at the higher elevations were rated as being either in PFC or were determined to be functional-at-risk with a downward trend. All three of these small drainages were described as being intermittent in 2011.

Although effects of livestock use were clearly exacerbated in 2013 as a result of severe drought conditions, current poor habitat conditions along the South Fork of Robinson Creek are the result of long-term livestock grazing impacts. Over use of limited streambank vegetation as well as trampling and compaction of streambanks has led to channel downcutting, draining of floodplain area and shifts in riparian and wetland plant communities to upland communities dominated by species such as wild rose, Scotch thistle (*Onoordum acanthium*) and Kentucky bluegrass (Figure 2-15). As functionality declines or is lost, sites such as these became less effective at storing or capturing spring runoff and tend to become more intermittent over time.

Condition of lotic riparian areas is better at higher elevations, both as a result of reduced grazing impacts but also as a result of stability naturally afforded by rocky substrates. Both drainages segments A and B were found to be stable and well vegetated in 2011. However, some sites are still being impacted by grazing even at higher elevations as illustrated by findings for drainage segment C. The functional-at-risk rating for this stream segment was the result of a small headcut. Head cutting often

occurs in response to development of preferred flow channels resulting from trampling and compaction of hydric soils. Head cuts can work upstream and effectively drain flooplains and meadow areas. Applicability of the functioning condition ratings for drainages A, B and C are limited somewhat by the intermittent nature of these areas.

Trampling and soil compaction creates a path for preferential flow and concentrated energy. Head cuts can work upstream and effectively drain floodplain and meadow areas.

Table 2-5. Summary of functioning condition assessments for lotic riparian areas in the Robinson Creek Allotment.

Location	Length (stream miles)	Year of Assessment	Functioning Condition Rating
Robinson Creek- South Fork			
Reach 1	1.2	2013	Functional-at-risk, downward trend
Reach 2 (intermittent tributary)	0.5	2013	Non-functional
Intermittent Drainages			
Drainage A	<0.1	2011	Proper functioning condition
Drainage B	<0.1	2011	Proper functioning condition
Drainage C	0.3	2011	Functional-at-risk, downward trend

Figure 2-15. South Fork Robinson Creek, Robinson Creek Allotment. November, 2013.

Lentic Riparian Habitat

Results of the 2011 functioning condition assessment for lentic riparian habitats in the Robinson Creek Allotment are variable (Table 2-6). Two sites were found to be functioning-at-risk with a downward trend, while one site was found to be non-functional. A fourth site (Robinson Creek 02) was found to be in PFC. Shrinking and loss of riparian areas as a result of soil compaction and trampling by livestock were identified as primary cause for the ratings of functional-at-risk or non-functional.

Table 2-6. Summary of lentic proper functioning condition assessments for Robinson Creek Allotment in 2011.

Spring Number	Rating
Robinson Creek 01	Functional-at-risk, downward trend
Robinson Creek 02	Proper functioning condition
Robinson Creek 03	Functional-at-risk, downward trend
Robinson Creek 04	Non-functional

Other – Aspen

A small fenced area encompassing about two miles of the North Fork of Indian Creek in the southern portion of the west half of the Robinson Creek Allotment provides protection for a fairly extensive aspen/willow corridor. The exclosed area includes both public and private lands and is used primarily for camping. Recent evidence of livestock use is limited and post-fire (1999 Sadler Fire) aspen regeneration is good to excellent (Wilkinson 2013).

Robinson Mountain Allotment

Riparian habitat in the Robinson Mountain Allotment includes Robinson and Little Porter Creeks as well as numerous seeps and springs, most of which occur at the higher elevations. Scattered pockets of aspen are also present in mountain areas. There are a few springs located at the lower elevations, many of which were developed at one time.

Lotic Riparian Habitat

Lotic functioning condition assessments were completed on six miles of Robinson Creek and a short reach of Little Porter Creek within the Robinson Mountain Allotment in 2011 and 2013 (Table 2-7). The majority of Robinson Creek was rated as being non-functional to functioning-at-risk with a downward trend in 2013. A small portion of the drainage in the downstream most reach was determined to be intermittent and not rated in 2013. This same area was rated as functioning-at-risk, with an upward trend in 2011; however, it was also described as being intermittent at that time. Although most of Little Porter Creek is located in adjoining allotments, a limited part of the drainage serves as a water gap for the Robinson Mountain Allotment. This area was determined to be non-functional in 2013.

Table 2-7. Summary of functioning condition assessments for Robinson Creek in the Robinson Mountain Allotment.

Location	Length (stream miles)	Year of Assessment	Rating
Robinson Creek			
Upper Reach	1.7	2013	Functional-at-risk, downward trend
Middle Reach	3.5	2013	Non-functional
Lower Reach	0.8	2011 2013	2011: Functional-at-risk, upward trend 2013: Not applicable; determined to be intermittent
Little Porter Creek			
Water gap	0.3	2013	Non-functional

Although rock provides for some vertical and lateral channel stability in the higher elevations of Robinson Creek (upper reach), functionality is impaired by long-term impacts of concentrated livestock use. Willow regeneration is limited by heavy browsing of seedlings, while streambank plant communities are composed mostly of facultative species and species associated with disturbance (Figure 2-16). A lack of riparian and wetland plants with root masses capable of withstanding high flows has led to localized channel downcutting and subsequent draining of floodplain areas. Historically, woody riparian species such as aspen and willow were likely important to stability of the relatively steep high energy headwaters. Roots of both species anchored stream banks against high flows, while downed aspen logs likely provided a series of step pools allowing for energy dissipation. Evidence of the historic extent of aspen is still visible in the form of old logs on side slopes and terraces throughout the reach.

Figure 2-16. Reach 1, Robinson Creek, Robinson Mountain Allotment. November, 2013.

The middle to lower reaches of Robinson Creek are highly degraded and were rated as being non-functional in 2013. The stream currently exists as a downcut channel with a relatively small floodplain confined between vertical banks (Figure 2-17). Historically, the steam functioned at the height of the

vertical banks and had a floodplain that included most of the valley width between toe slopes. It is also likely the floodplain was inundated for longer periods of time. Evidence of this former state is visible in the soil profiles exposed by the cut banks. Indicators of persistent water including peat (organic) layers and layers stained by concentrations of elements such as iron and manganese (Lewis et al. 2003, Prichard et al. 1999, Revised 2003) are common at various depths in the soil profiles all along the middle reaches of Robinson Creek (refer to Figure 2-17). Current conditions are the result of land use practices (primarily livestock grazing) combined with natural events including fire and floods which collectively have led to loss of plant cover and to conditions of accelerated rates of runoff and erosion. The extent of soil loss that has occurred in relatively recent times (as indicated by the still living willow) is evident in Figure 2-18 which shows the height and extent of exposed roots where soil has been eroded away.

In its current configuration, Robinson Creek functions more like a flume with high power for transporting water and sediment than a properly functioning stream which acts to dissipate energy and allow for retention of water and soil. Although initial channel incision likely occurred decades ago, current livestock grazing practices are preventing recovery of the riparian zone and development of a functional floodplain at the lower elevation. In addition, adjacent terraces (formerly floodplains) are also heavily impacted from concentrated livestock use and are currently characterized by high levels of bare ground as well as infestations of cheatgrass (Bromus tectorum) and Scotch thistle (Figure 2-19). Although grazing impacts to riparian areas were exacerbated during the extremely dry years of 2012 and 2013, many of the changes and conditions described here are the result of chronic long-term concentrated livestock use along riparian areas.

Left: Figure 2-17. Middle Reach, Robinson Creek. Right: Figure 2-18. Robinson Creek. Robinson Mountain Allotment. November, 2013.

Figure 2-19. Middle Reach, Robinson Creek, Robinson Mountain Allotment. November, 2013.

The very lower reaches of Robinson Mountain Creek are intermittent with limited response potential. However, areas adjacent to the stream channel which are currently dominated by upland plants likely historically functioned as floodplains with at least some potential for capture and storage of spring runoff (Figure 2-19). At one time, these areas probably supported more mesic vegetation.

Figure 2-20. Lower Reach, Robinson Mountain Creek, Robinson Mountain Allotment. November, 2013.

The portion of Little Porter Creek in the Robinson Mountain is currently non-functional (Figure 2-21). Floodplains are drying as evidenced by presence of both facultative and upland plant species in areas that should support riparian species. Sinuosity has been lost as a result of channel straightening (historic meander patterns are visible in Figure 2-21), while heavy to severe use of streambank vegetation combined with high level of trampling by livestock has resulted in poorly vegetated, unstable

streambanks. Historically, this portion of Little Porter Creek supported aspen and willow as evidenced by old logs and by the presence of both these species in adjacent pastures with different grazing histories. The degraded conditions characteristic of this reach of Little Porter Creek as well as the loss of woody riparian species is indicative of concentrated long-term use of the area by livestock.

Figure 2-21. Little Porter Creek, Robinson Mountain Allotment. November, 2013.

Sadler Fire

In 1999, the Sadler Fire burned most of the upper elevations of the Robinson Mountain Allotment including terraces and slopes immediately surrounding Robinson Mountain Creek. In response, BLM seeded over 3,000 acres with native and non-native grasses and forbs including terraces adjacent to Robinson Creek. The allotment was also rested for two years in an effort to allow for re-establishment of seeded species and for recovery of unseeded areas. Although seeding success of adjacent uplands was variable (Elko District files), excellent response of riparian plants along Robinson Creek was observed in 2001 (Wilkinson 2014). Observations in 2013 indicate this area is now dominated by bareground and annuals (Figure 2-22). A small exclosure was also constructed along Robinson Creek following the fire in an effort to protect regeneration of burned aspen. Observations in 2013 indicate the exclosure has been effective in allowing for growth and establishment of aspen suckers (Figure 2-23).

Left: Figure 2-22. Robinson Creek, area of 1999 Sadler Fire; Right: Figure 2-23. Aspen exclosure, Robinson Creek. Robinson Mountain Allotment, November, 2013.

Lentic Riparian Habitat

BLM conducted lentic PFC assessments on a representative sample of seeps, springs and historic meadow areas in the Robinson Mountain Allotment in 2010 (Table 2-8). Of seven sites assessed, only one was rated as being in PFC. This particular spring (Robinson Mtn 05), is located in an aspen stand and is largely protected from livestock as a result of barriers formed by downed branches and logs. For the remaining six sites, all were either non-functional or functioning at risk with a downward to not apparent trend. Impacts from livestock including tramping and compaction of soils and long-term overuse of riparian plant species has caused shrinking and loss of the riparian area (Figure 2-24). Many of the seeps and springs located in the higher elevations of the Robinson Mountain Allotment occur on fairly steep slopes and are especially susceptible to development of headcuts and draining of riparian and meadow areas (Figure 2-25).

Table 2-8. Summary of lentic proper functioning condition assessments conducted for the Robinson Mountain Allotment in 2010.

Spring Number	Rating
Robinson Mtn 01	Non-functional
Robinson Mtn 02	Non-functional
Robinson Mtn 03	Functional-at-risk, trend not apparent
Robinson Mtn 04	Functional-at-risk, trend not apparent
Robinson Mtn 05	Proper functioning condition
Robinson Mtn 06	Functional-at-risk, downward trend
Robinson Mtn 07	Non-functional

Left: Figure 2-24. Robinson Mtn 03; Right: Figure 2-25. Headcut on hillside spring. Robinson Mtn 07. Robinson Mountain Allotment, July, 2010.

Robinson Mountain FFR

The Robinson Mountain FFR Allotment includes approximately 1.5 miles of Little Porter Creek located on public land. Riparian vegetation is confined to the upper portion of the reach.

All of Little Porter Creek within the allotment was determined to be non-functional in 2013. Although the stream is perennial, much of it exists as a gully with no floodplain and no remaining riparian plant

communities. In the upper portion of the reach, the stream still has access to the floodplain, however, this area is threatened by an active head cut located immediately downstream (Figure 2-26). This part of the stream is especially vulnerable to incision since stabilizing riparian vegetation is nearly absent or is severely browsed (in the case of aspen and willow). In downstream areas, Little Porter Creek exists as a deep gully (Figure 2-27). Areas now dominated by big sagebrush supported aspen and willow before the channel became down cut. Scattered logs and branches occur along these terraces provide evidence that the stream functioned at the elevation of what is now a terrace (Figure 2-28).

Figure 2-26. Little Porter Creek, upper portion of reach. Robinson Mountain FFR. November, 2013.

Figures 2-27 and 2-28. Little Porter Creek, lower reach. Robinson Mountain FFR. November, 2013.

Twin Creek East

Riparian habitat on public lands is limited to a small partially intermittent drainage flowing from a spring complex on private land. Nebraska sedge communities dominate areas where surface and subsurface flows are persistent throughout the summer.

A functioning condition assessment was completed for two reaches encompassing about 1.5 miles of this drainage in 2009 (Table 2-9). A portion of the drainage located near the spring source was rated as functional-at-risk with no apparent trend. The at-risk rating was the result of impacts created from trampling by livestock including development of hummocks and spreading of water in place of a defined channel. The remaining one mile of the assessed portion of the drainage was found to be stable and well vegetated during the 2009 assessment.

Table 2-9. Summary of functioning condition assessments for the Twin Creek East Allotment.

Location	Length (stream miles)	Year of Assessment	Rating
Upstream (near spring source)	0.5	2009	Functional-at-risk, trend not apparent
Downstream	1.0	2009	Proper functioning condition

Twin Creek North

A small drainage originating in the Twin Creek East Allotment continues into the Twin Creek North Allotment. Although the drainage-way is several miles long, only a portion supports persistent surface and/or subsurface flow. Riparian vegetation occurs along these areas where moisture is available.

Although the drainage in the Twin Creek North Allotment has not been assessed for functionality, observations in May of 2013 indicate the riparian area has shrunk from its historic extent and that heavy trampling is altering flow patterns and creating hummocks with associated shifts in plant communities (Figure 2-29). Areas immediately adjacent to the stream channel are now characterized by bare ground or upland plants, while facultative species occur in wet areas where hummocking has allowed for drying of formerly hydric soils.

Figure 2-29. Unnamed drainage, Twin Creek North Allotment. May, 2013.

Twin Creek South

Riparian habitat in the Twin Creek South Allotment includes a single spring in the northeastern portion of the allotment. The spring has altered by an old development and includes several small drainages just below the source. A collection box has been installed in the source and there is a non-operational trough located within the drainage several hundred feet downstream (Figure 2-30). Evidence of a berm just below the collection box suggests the area was also excavated to form a pond at one time.

Figure 2-30. Non-operational trough in drainage below spring (Twin Creek South 01). Twin Creek South Allotment, November, 2013.

In 2013, the spring (Twin Creeks South 01) was determined to be functioning-at-risk with a downward trend. Although the area occupied by riparian vegetation is greater now than in 1981 (based on photos from BLM's water resource inventory), excessive hummocking from high levels of trampling and compaction by livestock are currently causing alteration of surface and subsurface flows (Figure 2-31). Areas which should support wetland and riparian plant species are now dominated primarily by Kentucky bluegrass and other facultative species. The placement of the livestock watering trough within the drainage itself has caused "pedalisting" of the structure as well as excessive trampling all around the trough.

Figure 2-31. Trampling impacts, spring (Twin Creek South 01).
Twin Creek South Allotment, November, 2013.

Additional Information

Although the riparian wetlands standards are not being applied to Little Porter and Little Porter FFR Allotments (due to a lack of riparian habitat), some information on these allotments was collected in 2013. Results of field inspections are summarized below:

Little Porter Allotment

Riparian habitat in the Little Porter Allotment is limited to several isolated stands of Coyote willow (*Salix exigua*) along the very lower intermittent reaches of Robinson Creek. Field observations suggest seasonal flows from Robinson Creek are currently not sufficient to maintain riparian plant communities. However, aerial photography as well as soil profiles visible in cut banks suggests that historically this area was wetter and supported small mesic meadows along the drainage. Livestock grazing impacts in the form of heavy use of riparian plants and high levels of trampling and associated soil compaction likely contributed to the loss of water storage in the system over time. A functioning condition assessment for this reach of Robinson Creek was not conducted.

Little Porter FFR Allotment

Although upstream areas along Robinson Creek historically functioned as a meadow, the portion of the drainage on public land in the Little Porter FFR is intermittent and is lacking riparian vegetation. A functioning condition assessment of this reach of Robinson Creek was not conducted.

Water Quality

Streams

Several of the significant streams in the South Jiggs Complex have been part of a water quality sampling collection program beginning in 2002. The most current sampling episode was a follow-up in July of 2014. The drainages sampled are the Pearl Creek drainage (Pearl Creek Allotment), Brown Creek (Lindsey Creek Allotment), Robinson Creek (Robinson Mountain Allotment) and South Fork Robinson Creek (Robinson Creek Allotment. The reaches for the South Jiggs Complex are established using a downstream specific control point pursuant to NAC 445A.145 or referred to as the "Tributary Rule". The specific control point used is the Huntington Creek at Smith Creek. The beneficial use listed by NDEP for Huntington Creek are Livestock, irrigation, Aquatic Life, Contact recreation, noncontact recreation, municipal use, industrial, and wildlife. The aquatic species of concern is trout. The criteria that the state of Nevada requires be maintained so that the waters of Huntington Creek and its tributaries can meet the listed beneficial uses are shown in Table 2-10. Parameters collected include stream discharge measurements, field probe and water quality samples for lab analyses. Hourly water temperature data on Pearl Creek was collected between June 1 through September 30 for the years of 2006, 2007 and 2008. These data were used to determine whether state water quality criteria are met for aquatic life and recreational contact beneficial use. The water quality standards for streams in the South Jiggs Complex are detailed in the Nevada Administrative Code (NAC) Chapter 445A.1364 (Table 2-10). An analysis of sampling results by parameter, followed by tables and figures are presented below:

Table 2-10: Nevada Standards of Water Quality - Huntington Creek at Smith Creek.

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X			
Aquatic Life Species of Concern			Trout.										
Temperature - °C ΔT^b - °C		S.V. ≤ 20 $\Delta T = 0$			*	X							
pH - SU		S.V. 6.5 - 9.0	X	X	*	*		X	X	*			
Total Phosphorus (as P) - mg/l		S.V. ≤ 0.10			*	*	X	X					
Dissolved Oxygen - mg/l		S.V. ≥ 6.0	X		*	X	X	X		X			
Total Ammonia (as N) - mg/l		[c]			*			X					
Total Dissolved Solids - mg/l		S.V. ≤ 500 or the 95th percentile (whichever is less).	X	X				*					

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
E. coli - No./100 ml		A.G.M. ≤ 126 S.V. ≤ 410				*	X						
Fecal Coliform - No./100 ml		≤ 200/400[d]	X	X		*	X	X		X			

Temperature

The beneficial use which requires the stringent water temperature criteria is aquatic life. This criterion is violated when water temperature rises over 20 °C. Nevada Department of Environmental Protection (NDEP) specifies that when continuous monitoring is used, maximum daily values are evaluated against the standard. If the standard is violated for more than 10% of the days being considered, then the standard is violated for the year.

BLM collected stream temperature data deploying continuous monitoring thermal data loggers in Pearl Creek. The temperature data available for Pearl Creek are presented in Table 2-11. However, the most recent data were recorded from 2006 to 2008. The number of days where maximum water temperature exceeded 20 C° for Pearl Creek is as follows.

Table 2-11. Number of days and percent of days that water temperature exceeded 20 C° from 2006 through 2008.

Sample site		Year	Total Number of Days	Days Exceed 20°C	Days Exceed 20°C (%)
Pearl Creek	Upper	2006	121	76	21
		2007	64	51	14
		2008	44	10	3
	Middle	2006	121	80	22
		2007	98	71	19
		2008	44	16	4
	Lower	2006	121	35	10
		2007	69	60	16
		2008	44	18	5

The assessment period for water temperature includes 2006, 2007 and 2008 for three different locations along the Pearl Creek drainage. Pearl Creek is found to exceed the 20 °C temperature limit greater that 10% of the time for the summers of 2006 and 2007 but not 2008. The Pearl Creek drainage would be categorized as 5 - Not Supportive.

pH

The beneficial uses requiring the most stringent pH criteria are aquatic life and contact recreation. To meet this criterion, pH range must fall between 6.5 and 9.0. The pH was measured 30 times at Pearl Creek, 10 times on Brown Creek, and 13 times on Robinson Creek between 2002 and 2014 (Tables 2-12 and 2-13). There were no measurements which fell below a pH of 6.5 within this period. Two readings in Robinson Creek were found to be above the 9.0 upper limit, but the number of samples outside the acceptable criteria was well below the amount that would result in a violation.

Total Phosphorus

The beneficial uses requiring the most stringent total phosphorus criteria are aquatic life and contact recreation. The phosphorus criterion is a total phosphorus concentration of less than 0.10 mg/L. Total phosphorus concentration was exceeded in 4 out of 18 samples on Pearl Creek, 1 out of 9 samples on Brown Creek, and 8 out of 8 samples on Robinson Creek. Pearl Creek Site B, a water gap for livestock along Pearl Creek, had 3 exceedances out of 5 samples found in the drainage. The number of exceedances on Site B of Pearl Creek and Robinson Creek would be enough to result in a violation of total phosphorus standards. These two drainages would be categorized as a 5 – Not supported. Two samples collected during the 2007 to 2014 period for the Pearl Creek drainage demonstrate that the total phosphorus levels are below the criteria required by the state.

Dissolved Oxygen

The beneficial use which requires the most stringent dissolved oxygen criterion is aquatic life. To meet this criterion for aquatic life dissolved oxygen concentration must be greater than 6.0 mg/l. In order to be considered in violation, a single exceedance below the minimum dissolved oxygen is required. All of the analytical results from Pearl Creek and Brown Creek but two meet the NDEP criterion for aquatic life beneficial use. The other exceedance is from the middle Pearl Creek site, near the water gap for livestock. None of the Robinson Creek and South Fork Robinson Creek samples meet the NDEP criterion. The two Pearl Creek sites sampled in July, 2014 demonstrate that dissolve oxygen levels are above the required 6.0 mg/L criterion. Pearl Creek would be categorized as a 2 – Some uses attained. Brown Creek, Robinson Creek and South Fork Robinson Creek were dry at the time of the latest sampling.

Bacteria

BLM has not taken sufficient E-Coli or Fecal Coliform samples at Pearl Creek, Brown Creek, Robinson Creek and South Fork Robinson Creek to determine whether the criteria are met.

Water Quality Summary

The results of the sampling of the significant drainages for the South Jiggs Complex are presented in Table 2-14. The Pearl Creek and Robinson Creek drainages are not supportive of the aquatic life beneficial use. The critical aquatic species in Pearl Creek is trout. Pearl Creek is the only drainage to maintain a trout population but not throughout the entire drainage. It is considered not supportive of aquatic life criterion due to elevated total phosphorus levels and higher temperature data. Brown Creek is considered fully supportive for all beneficial uses even though it is an intermittent stream. Robinson Creek is not supportive for aquatic life beneficial use because of the high total phosphorus levels. The stream temperature data is insufficient. South fork of the Robinson Creek has insufficient data to support determination for Aquatic life, Recreational water with contact and wildlife propagation.

Table 2-12. Chemical Properties of Water Samples

		Parameters collected and analyzed by BLM personnel and equipment						Parameters Analyzed by a Certified Laboratory									
Source Name	Site ID	Sample Date (YYYYMMDD)	Flow (CFS)	pH	Dissolved Oxygen (mg/L)	Turb. (NTU)	Suspended Solids (mg/L)	EC (uS/cm)	Nitrate (mg/L)	Nitrite (mg/L)	Nitrate Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Total available Phosphorous (mg/L)	Ortho-phosphate (mg/L)	Sulfate (mg/L)	Total Phosphorus (mg/L)	Fecal Coliform #/100ml	Total Dissolved Solids (mg/L)
Brown Creek	Site A (Upper)	20020820	0.147	8.43	9.9	0.6	0	275										
	Site A (Upper)	20021018	0.116	8.44	10.7	0.33		320					0.17	0.52				
	Site A (Upper)	20030501	0.337	8.7	7.2	1.22	0	273					0.09	0.28	0			
	Site A (Upper)	20040517	3.108	8.63	7.7	3.08	5	278					0.085	0.26	0.49			
	Site A (Upper)	20050614	1.63	8.43	9.27	48.5	10	330	2.3	0			0.02	0.05	0			
	Site A (Upper)	20050620	1.64	8.53	9.16	40.4	6	319					0.03	0.09	0			
	Site A (Upper)	20050620	1.64	8.53	9.16	40.4	6	319					0.03	0.09	0			
	Site A (Upper)	20140722	Dry															
	Site B (Lower)	20021018	0.104	8.6	9.2	0.34	0	285					0.055	0.17				
	Site B (Lower)	20040517	1.168	8.64	7.4	3.57	11	271					0.075	0.23	0.54			
	Site B (Lower)	20050620	1.17	8.56	7.77	32.4	11	297					0.03	0.09	0			
	Site B (Lower)	20140722	Dry															
Robinson Creek	Sec. 29 (upper)	20050505	33.7	7.99	9.15	59.4	35	159	0.3	0			0.12	0.36				
	Sec. 29 (upper)	20050531	8.78	8.4	8.1	12.4	8	262	2.3	0			0.44	1.35	21			
	Sec. 29 (upper)	20050718	0.117	9.62	9.95	2.3	6	305	3.6	0.001			0.19	0.58	47			
	Sec. 29 (upper)	20060531	2.84	8.5	7.7	10.2		278										
	Sec. 29 (upper)	20060703	0.399	8.81	7.65	7.1		377										
	Sec. 29 (upper)	20140722	Dry															
	Sec. 4 (lower)	20050505	37.7	8.07	9.64	128	34	178	0	0			0.18	0.54				
	Sec. 4 (lower)	20050531	8.32	8.2	8.68	14.7	9	287	0.7	0			0.13	0.41	22			
	Sec. 4 (lower)	20060531	1.98	8.67	7.02	3.7		318										
	Sec. 4 (lower)	20140720	Dry															
SF Robinson Creek	lower	20050505	7.59	8.55	9.05	48.5	35	266	0	0.003			0.12	0.36				
	lower	20140722	Dry															
	upper	20050531	1.09	8.57	7.88	4.3	3	426	2.3	0			0.12	0.38	51			
	upper	20050531	2.26	9.29	8.68	9	7	389	1.3	0			0.15	0.45	56			
	upper	20060531	0.827	8.34	7.84	5.2		554										
	upper	20060703		7.65	9.22	4.2		707										
	upper	20140722	Dry															

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Table 2-13. Chemical Properties of Water Samples

		Parameters collected and analyzed by BLM personnel and equipment						Parameters Analyzed by a Certified Laboratory										
Source Name	Site ID	Sample Date (YYYYMMDD)	Flow (CFS)	pH	Dissolved Oxygen (mg/L)	Turb. (NTU)	Suspended Solids (mg/L)	EC (uS/cm)	Nitrate (mg/L)	Nitrite (mg/L)	Nitrate Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Total available Phosphorous (mg/L)	Ortho-phosphate (mg/L)	Sulfate (mg/L)	Total Phosphorus (mg/L)	Fecal Coliform #/100ml	Total Dissolved Solids (mg/L)
Pearl Creek	Site A (Upper)	20021024	0.243	8.41	10.7	1.3	1	347					0.12	0.38				
	Site A (Upper)	20030501	2.4	8.62	8.4	2.68	2	325					0.09	0.29				
	Site A (Upper)	20040511	6.863	8.6	9.3	5.45	6	320					0.055	0.17	0.49			
	Site A (Upper)	20050620	16	8.36	8.7	19.5	7	342					0.023	0.07	16			
	Site A (Upper)	20050927	0.695	8.12	8.66	5	0	298	3	0.001			0.075	0.23	0			
	Site A (Upper)	20050927	0.695	8.12	8.66	5	0	298	3	0.001			0.07	0.23	0			
	Site A (Upper)	20060602	11.96	8.1	9.48	15.4		291										
	Site A (Upper)	20060926	0.445	7.87	9.23	4.3		297										
	Site A (Upper)	20070605	3.27	8.41	10.57	25.9		308										
	Site A (Upper)	20070913																
	Site A (Upper)	20080709	1.5	8.4	9.98			286								<0.009	247	180
	Site A (Upper)	20080819	0.0652	8.52	7.232			240.1			<0.010	<0.010				0.011		
	Site A (Upper)	20140722		8.31	8.34	4.8		242.7			0.017	ND				ND	14	
	Site B (Middle)	20020814	0.145	8.17	5.7	0.85		245					0	0				
	Site B (Middle)	20021024	0.177	8.2	8.4	1.61	2	343					0.34	0.11				
	Site B (Middle)	20040511	6.714	8.6	9	17.1	14	320					0.068	0.21	0.64			
	Site B (Middle)	20050927	0.838	8.34	8.11	3.2	0	296	1.1	0.002			0.11	0.33	1			
	Site B (Middle)	20050927	0.838	8.34	8.11	3.2	0	296	1.1	0.002			0.11	0.33	1			
	Site B (Middle)	20060602	11.12	8.15	8.32	19		284										
	Site B (Middle)	20070605	2.19	8.44	9.74	13		300										
	Site B (Middle)	20070913	Dry															
	Site B (Middle)	20080523	7.52	8.82				260										
	Site B (Middle)	20080709	0.38	8.42	8.98			276								<0.010	137	160
	Site B (Middle)	20080819	0.218	8.19	5.947			274.9			<0.010	<0.010						
	Site B (Middle)	20140722		8.31	7.6	26.3		263.2			0.011	ND		0.021			1800	
	Site C (Lower)	20021024		8.36	8.2	1.45	0	339					0.1	0.31		0.013		
	Site C (Lower)	20040511	7.344	8.59	9	10.4	22	320					0.016	0.05	0.99			
	Site C (Lower)	20050620	16.9	8.17	8.66	19	8	342					0.023	0.07	10			
	Site C (Lower)	20050620	16.9	8.17	8.66	19	8	342					0.02	0.07	10			
	Site C (Lower)	20050927	0.727	8.4	2.59	4.2	0	293	5.2	0.004			0.07	0.22	0			
	Site C (Lower)	20050927	0.727	8.4	8.59	4.2	0	203	5.2	0.004			0.07	0.22	0			
	Site C (Lower)	20070605	Dry	8.47	9.99	13..5		298										
	Site C (Lower)	20070913	Dry															

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Table 2-14. Waterbody Assessment Results (NDEP 2014)

Waterbody ID	Stream Reach	Beneficial Uses							
		WLS	IRR	AQL	RWC	RNC	MDS	IND	PWL
NV04-SF-113_00	Pearl Creek	F	F	N	F	F	F	F	F
NV04-SF-102_00	Brown Creek	F	F	F	F	F	F	F	F
NV04-SF-116_00	Robinson Creek	F	F	N	F	F	F	F	F
NV04-SF-117_00	South Fork Robinson Creek	F	F	I	I	F	F	F	I

F- Fully Supporting
I - Insufficient Information
N - Not Supporting
WLS - Watering of Livestock
IRR - Irrigation
AQL - Aquatic Life
RWC - Recreation involving contact with water
RNC - Recreation not involving contact with water
Municipal or Domestic Supply
IND - Industrial Supply
PWL - Propagation of Wildlife

Seeps and Springs

Seep and spring habitats occurring within the South Jiggs Complex have not been designated and as such, are addressed under narrative standards. The narrative standards contained in NAC 445A.121 apply to all surface waters of the state and require waters to be free from various pollutants in sufficient levels so as to not be unsightly, interfere with any beneficial uses, create a public nuisance, be toxic to human, animal, plant, or aquatic life, or have any adverse effects. No violations of narrative standards were documented for seeps and springs in the South Jiggs Complex as part of BLM's lentic functioning condition assessments conducted between 2010 and 2013.

Wildlife Data

Vegetative Composition, Diversity and Cover

Line intercept studies provide a method for collecting vegetative cover (canopy and basal cover) and shrub, grass and forb species composition data. Relative to monitoring the availability of lateral nesting cover for sage-grouse, the "droop height" of herbaceous perennial native plant canopy cover was monitored at Key Areas throughout the South Jiggs Complex.

Vegetative Shrub Height, Foliar Cover and Condition

Vertical cover data provides a way to evaluate changes in vegetation structure and helps determine whether cover is adequate for wildlife species. In addition, shrub height measurements were recorded along the line.

Browse Form and Age Class

Browse form and age class data are used to determine if overuse is occurring on important browse species and if the age class diversity is providing for the needs of the wildlife species and is adequate to maintain the health of the vegetative community.

Disturbance/Interference Factors

Livestock control fencing, as disturbance or interference factors have been documented and considered for the big game habitat rating system. The facilitation of big game movements under or over livestock control fencing was not considered at the time that many fences on the allotment were constructed or existed during, or prior to, the range adjudication process (e.g. 1940s to 1960s era or earlier). Fence hazards on big game and sage-grouse seasonal use habitat areas are a concern where wire spacing modifications and other measures are needed to help make the fence outline more visible which would help to minimize the potential for entanglement with fence wires. Modification of potential fence hazards to BLM specifications have been completed on public lands on some of the allotments on the South Jiggs Complex. This includes post-wildfire repair or reconstruction of BLM-administered allotment boundary and pastures division fence projects, and approved cooperative projects. Additional work on public lands, and any coordinated effort on private lands, is needed as part of long-term efforts on the Elko District. The documentation of many fence locations with fence wire spacing specifications that need to be modified, to help facilitate big game movements throughout the grazing allotments on the South Jiggs Complex, are on file and available from the BLM Tuscarora Field Office. Fence modifications efforts to lower the top wire height to BLM specs would also help to reduce the potential for sage-grouse/other bird collisions while in flight while still allowing for livestock control. Refer to Figures 3-1 and 3-2 for examples of fencing within the South Jiggs Complex that inhibit wildlife movement.


Figure 3-1 and 3-2. Example of barbed wire and net wire fencing that inhibits wildlife movements.

Other Monitoring Information

The information shown above can be used, along with additional monitoring data such as herbaceous utilization and ecological status condition to make determinations regarding the quality of habitat the area is providing for wildlife species, including sage-grouse and mule deer. Scientific references (Gregg 1994, Winward 1991, and Connelly et al. 2000) were also used to help make any determinations on sage grouse habitat quality.

Browse Utilization

Summer browse utilization is generally livestock and incidental summer deer use of current year's growth on deer winter range areas monitored in the summer or fall at the end of the livestock season-of-use. Winter utilization is generally mule deer and other potential big game winter use monitored prior the start of the current year's growing season as measured in the early spring. Spring utilization, such as with early use by cattle or as part of domestic sheep use areas, has been monitored on grazing allotments after the big game winter use period. For specific allotments, the summer or fall utilization reading at the end of cattle season-of-use period forms the base measurement for any additive winter and spring utilization reading. Annual utilization is combined summer, winter and spring utilization from the preceding year's growing season monitored the following spring prior to start of current year's growth.

Key Browse Age and Form Class

When Big Game Habitat Condition Trend Monitoring is completed in the late spring or early summer during active browse (e.g.) bitterbrush leader growth, it is often difficult to monitor utilization. Therefore, form class is monitored which shows degrees of hedging on previous year's woody leader growth.

> Interpretation of Satisfactory Age and Form Class Per BLM Technical Manual 4400-3 and BLM Form 6630-3:
>
> Age Class: When the sum of seedlings and young plants in the sample outnumber decadent plants, the key browse species age class is satisfactory at the monitoring site.
>
> Form Class: When the two-year-old growth (the previous year's leaders) of mature, seedling, young, respouting, and decadent (>50% of the canopy area dead) plants in the sample reflect

less than 50% utilization (41-60% utilization class interval), and outnumber severely hedged (61% or more utilization of two-year-old growth), unavailable (at least 50% of crown out of reach of cattle and big game), and dead plants, the key browse species form class is satisfactory at the monitoring site.

Further considerations regarding key browse form class per BLM Technical Manual 4400-3 - Browse plants are considered to reflect the normal growth form when less than 50 percent of the two-year-old growth (the previous year's leaders) has clipped ends and the majority of the current leaders extend directly from terminal buds off two-year-old wood. Alterations from the normal growth form are reflected when 50 percent or more of the two-year-old wood has clipped ends. Current leaders occur mostly as extensions from lateral buds off two-year-old wood in the moderately hedged condition or as clumped lateral and/or adventitious sprouts in the severely hedged condition.

Achurra Seeding Allotment

Key Study Transect DY-T-90-05 and LKA N #1
Transect established and monitored on July 30, 1990, and monitored again on July 10, 2008 and August 4, 2011. Located on the East Field on the same transect as LKA N#1. Characterized by the Wyoming big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site.

The mule deer habitat was not rated for monitoring completed in 1990. This was apparently due to the area being a "Seeding Area" with native habitat compromised by past successful crested wheatgrass seeding efforts and minimal reestablishment of native herbaceous species.

Crested wheatgrass (85.3%); Wyoming big sagebrush (7.8%), Hood's phlox (2.0%), aster (1.0%) and green rabbitbrush (3.9%) comprised 100% of the entire vegetative sample in 2008. There was a general lack of native understory forb species and total absence of native grasses on the transect. Intact native range areas exist on drainage slopes that apparently were too steep to seed to crested wheatgrass areas on the allotment. These areas were not monitored between 1990 and 2014. Monitoring completed in 2011 will be used to analyze sage-grouse habitat.

Key Browse Condition Wyoming big sagebrush
The form and class was satisfactory in 1990 and 2008. Shrub foliar cover for both Wyoming big sagebrush and green rabbitbrush decreased from 4.8% in 1990 to 1.0% in 2008. Shrub cover is considered to be "dotted" to widely scattered primarily providing habitat for wildlife species that utilize relatively "open habitat" on a seasonal or yearlong basis such as, but not limited to, horned larks, black-tailed jackrabbits and pronghorn. Localized areas with Wyoming big sagebrush die-off was observed in the interior part of the allotment on April 17, 2014.

Figure 3-3. Achurra Seeding Allotment East Pasture KA #N1. August 4, 2011

Browne Allotment

Key Study Transect DY-T-90-03 -West of Huntington Creek - Monitored on June 17, 2013
Key Study Transect DY-T-90-04 - Sadler Basin - Monitored on June 3, 2013

Both transects were established on July 9, 1990 on intact native rangeland areas. Both sites are characterized by the Wyoming big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site. Mule deer seasonal use management emphasis is for Transition Range. The habitat was rated as being in "Fair" condition for mule deer at both study transects as indicated by monitoring completed on June 3, 2013 and June 17, 2013.

Pronghorn
Documented dispersed spring and summer use has been observed. More concentrated fall and winter use by winter groups could potentially occur on the area.

Key Study Transect DY-T-90-03
Sandberg's bluegrass (7.7%); Wyoming big sagebrush (67%), bottlebrush squirreltail (1.6%), Indian ricegrass (2.8%), and green rabbitbrush (18.9%), all native species, comprised 98% of the entire vegetative sample in 2013. Cheatgrass (0.3%), pepperweed (0.1%), lupine (0.4%) and blue-eyed Mary (native forb, 0.1%) comprised the remainder of the sample. There was a general lack of understory native grass and forb species.

Key Study Transect DY-T-90-04
Sandberg's bluegrass (10.1%); Wyoming big sagebrush (46.9%), bottlebrush squirreltail (3.4%), Indian ricegrass (0.5%), fleabane daisy (28.3%), long-leafed phlox (4.8%), pincushion flower (1.6%), false dandelion (0.4%), all native species, comprised 96% of the entire vegetative sample in 2013. Cheatgrass (1.1%), pepperweed (0.1%), groundsmoke (0.2%), Hood's phlox (1.1%), bur buttercup (0.4%) and blue-eyed Mary (1.1%) comprised the remainder of the sample.

Key Browse Condition Wyoming big sagebrush

Key Study Transect DY-T-90-03

The form class was satisfactory and age class unsatisfactory with the latter rating due to dead and decadent plants outnumbering seedling and young age class plants on the transect by a margin of 19 to one. Live sagebrush and rabbitbrush foliar cover was 17.7% and was much higher prior to natural defoliation of dead and decadent sagebrush.

Key Study Transect DY-T-90-04

The age and form class was satisfactory. Sagebrush foliar cover was 7.4%, due, in part, to some mortality effects with the transect being on the edge of the 2000 Basin Fire perimeter. Decreased competition for space and water has likely allowed sagebrush to fare better than areas with much higher foliar cover during 2011-12 and 2012-13 severe drought conditions. Otherwise, foliar cover has not differed to a large degree from 6.6% sampled in 1995 and 9.9% in 1990. (See narrative below for sage-grouse habitat in regard to sagebrush cover.)

Figure 3-4. DY-T-90-03. West 6/25/1995

Figure 3-5. DY-T-90-03. West. 6/17/2013

Figure 3-6. DY-T-90-03. East. 6/27/1995

Figure 3-7. DY-T-90-03. East. 6/17/2013

Figure 3-8. DY-T-90-04. South. 6/27/1995

Figure 3-9. DY-T-90-04. South. 6/3/2013

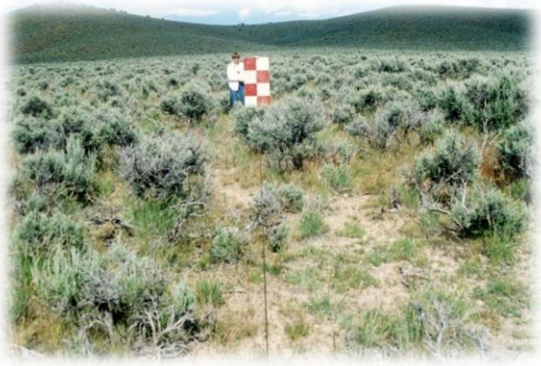


Figure 3-10. DY-T-90-04. North. 6/27/1995

Figure 3-11. DY-T-90-04. North. 6/3/2013

Corral Canyon Allotment

No quantified big game habitat condition and trend work has been completed on this allotment. (Rangeland forage production monitoring data, and sagebrush height and crested wheatgrass "droop height" measurements completed on July 26, 2011 were used to help analyze sage-grouse habitat conditions).

Figure 3-12. Corral Canyon Seeding KA#1

Figure 3-13. Corral Canyon Seeding Allotment

Corta FFR Allotment

No quantified terrestrial wildlife habitat condition and trend work has been completed on this "Fenced Federal Range" allotment that encompasses approximately 20 acres of public lands. The rangeland Apparent Trend analysis was "Downward" as of the 1987 Elko Resource Management Plan – EIS Record of Decision. The northern portion of the allotment, albeit native rangelands on private lands, had residual native herbaceous cover that would help to provide wildlife habitat cover and forage diversity, as observed on February 24, 2014. This would include habitat for mule deer and sage-grouse, both Resource Management Plan-featured species.

Lindsay Creek Allotment

Key Study Transect DY-T-87-07

The transect was established on June 25, 1987. Monitored on June 25, 1987 and May 15, 2013, plus Key Browse monitoring completed on August 27, 2002. Characterized by the big sagebrush – antelope bitterbrush vegetation type within a Loamy 10-12" Precipitation Zone (P.Z.) ecological site. Other vegetation types exist in close proximity to the key area. Utah juniper "expansion" has occurred on the area away from "established" woodland sites (extent would be determined by any past soil surveys for woodland sites). The immediate area surrounding the key area transect has been affected by the 1990 Lindsay Fire to the north and 1999 Mitchell Fire to the south with some positive results on the Lindsay Fire burn area as of 2013 (see separate browse transect information below).

The habitat was rated as being in "Fair" condition in 1987 and 2013. In 2013 Hood's phlox (28.1%), green rabbitbrish (42.6%), and bur buttercup - an exotic annual weed (4.7%), Utah Juniper (9.7%) (not sampled during transect establishment), Sandberg's bluegrass (5.5%), Indian ricegrass (4.3%) and bulbous bluegrass (2.1%) comprised 97% of the entire vegetative sample. The remainder of the sample included native forbs and grasses: blue-eyed Mary, vetch and bottlebrush squirreltail; and exotic annual forbs and grass: cheatgrass (0.3%), mustard and pepperweed.

Key Browse Condition – Antelope bitterbrush

The form class improved to satisfactory in 2002 and remained the same in 2013. The age class has declined to unsatisfactory condition as indicated by no observed seedling or young age class plants and 32% of the sample as dead or decadent plants. Live bitterbrush standing cover has been severely impacted. A "total search" of the key area locale and the Lindsay Fire burn area to the north was needed to obtain adequate monitoring samples in 2013. See Figures 3-14 through 3-17 for representative plants in 2013.

Figure 3-14. DY-T-87-07. East. May 15, 2013

Figure 3-15. DY-T-87-07 May 15, 2013. Bitterbrush

Figure 3-16. Lindsay Creek, Brown Pasture KA #2.

Figure 3-17. Lindsay Creek Allotment

Little Porter Allotment

Key Study Transect DY-T-89-08

The transect established on July 28, 1989 on an intact native rangeland area. Characterized by the Wyoming big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site. Mule deer seasonal use management emphasis is considered "Low Density." Pronghorn: Documented dispersed spring and summer use has been observed. More concentrated fall and winter use by winter groups of up to two to three hundred pronghorn potentially occurs on the area.

The habitat was rated as being in "Fair" condition as indicated by monitoring completed on May 23, 2013. In 2013 Sandberg's bluegrass (18.2%); Wyoming big sagebrush (44.4%), bottlebrush squirreltail (1.1%), upland sedge (11.9%), Western wheatgrass (2.1%) and green rabbitbrush (14.7%), all native species, comprised 92.4% of the entire vegetative sample in 2013. Cheatgrass (2.4%), two species of pepperweed (1.1%), burr buttercup (1.2%) were exotic annual species that comprised an additional 4.7% of the sample. There was a general lack of native forb species and the average height of the "short-statured" native grass and forb species was 2.5 inches (see Figure 3-18).

Key Browse Condition – Wyoming big sagebrush
The form class was satisfactory and age class unsatisfactory with the latter rating due to dead and decadent plants outnumbering seedling and young age class plants on the transect by a margin of over two to one (25 dead/decadent versus 12 yearling plants).

Figure 3-18. DY-T-89-08 East. 5/23/13

Figure 3-19. DY-T-89-08 WY big sagebrush 5/23/13

Little Porter FFR Allotment

No quantified terrestrial wildlife habitat condition and trend work has been completed on this "Fenced Federal Range" allotment that encompasses approximately 97 acres of public lands.

Merkley-Zunino Seeding Allotment

DY-T-89-07 and LKA#1.
Transect established on July 28, 1989 on an intact native rangeland area. Characterized by the big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site. Mule deer seasonal use management emphasis is considered "Transitional" Pronghorn: Dispersed spring and summer use likely occurs. The majority of the allotment was type-converted to crested wheatgrass seeding areas in the 1950s to 1960s period.

The mule deer habitat was rated as being in "Good" condition as indicated by monitoring completed in 1989. Sandberg's bluegrass (25.3%); Wyoming big sagebrush (57.3%), cheatgrass (3.3%), phlox (11.3%) and green rabbitbrush (2.6%), comprised 100% of the vegetative sample. No native tall-statured grasses or forbs were sampled.

The mule deer habitat was rated as being in "Fair" condition as indicated by monitoring completed on April 17, 2014. Sandberg's bluegrass (19.4%); Basin/Wyoming big sagebrush (30.5%); green rabbitbrush (12.4%); bur buttercup (23.8%), an annual exotic weed; crested wheatgrass (5.6%) and Hood's phlox (3.1%), comprised 95% of the vegetative sample. No native tall-statured grasses or forbs were sampled.

Key Browse Condition Wyoming big sagebrush
The form class was satisfactory and age class unsatisfactory with the latter rating due to dead and decadent plants outnumbering seedling and young age class plants on the transect. In 1989 it was by a margin of over two to one (25 dead/decadent versus 12 yearling plants).

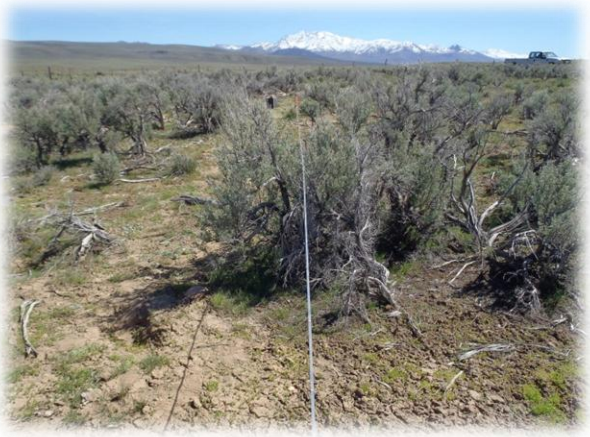


Figure 3-20. Merkley-Zunino Seeding DY-T-89-07

Figure 3-21. Merkley-Zunino Seeding DY-T-89-07

Mitchell Creek Allotment

Key Area Study Transect DW-MTLC-01-91 - Belmont Field
One wildlife key area study transect (DW-MTLC-01-91) has been established on the Belmont Field (native vegetation) portion of the allotment where emphasis is for monitoring mule deer habitat. Wildlife Habitat Condition Monitoring data, including line intercept, vertical cover, and browse form and age class was collected at this key area in 1991, 1994 and 2012 with additional key browse data collected in 1995 (Figures 3-22 and 3-23).

This key area does not represent suitable sage-grouse nesting cover as of 2012 due, in part, to expansion of Utah juniper on an ecological site that is characterized by the big sagebrush-bitterbrush vegetation type. Although not quantified, the increase in juniper height and density is apparent when comparing photos taken at the key area in 1991 (Figure 3-22) and 2012 (Figure 3-23). In addition, as indicated by basal cover measurements, adequate herbaceous cover needed for lateral nesting cover was not available in 2012. Management actions to reduce juniper cover on non-woodland ecological sites characterized by big sagebrush-bitterbrush vegetation type, and seeding efforts to increase perennial native grass and forb cover, would be needed if there is a priority to increase the suitability of sage-grouse seasonal use habitat on the area. The area also helps provide movement corridors for sage-grouse broods from lower elevation nesting and early brood-rearing areas to late brood-rearing areas at mid to upper elevation on the Ruby Mountains. Thinning of juniper stands would help to provide for grouse movement corridors that might otherwise be avoided due to the presence of tall structures and potentially heavier tree cover over time on the landscape.

Figure 3-22. DW-MTLC-01-91. West

Figure 3-23. DW-MTLC-01-91. West

Mule Deer Habitat Condition ratings ranged from "Fair" condition in 1991 and 1994 to "Good" condition in 2012. Antelope bitterbrush age and form class was satisfactory on July 12, 2012 (Figure 3-24); form class has been maintained in satisfactory condition since initial transect establishment in 1991.

Figure 3-24. DW-MTLC-01-91. Bitterbrush. July 12, 2012.

1990 Lindsay Fire Burn Area

A key browse transect (DW-MTLC-02-94) was established on the 1990 Lindsay Fire burn area on the northern portion of the Belmont Field Pasture in 1994 (Figure 3-25). This was established to monitor browse recovery on this wildfire burn area. Although not quantified, an ocular estimate in 2012 suggests that a diversity of native shrubs, grasses and forbs have reestablished since the fire and are providing forage and cover diversity for wintering and transitory (intermediate range) use for mule deer, as well as the same diversity for other wildlife species including sage-grouse. Antelope bitterbrush (Plant Code: PUTR2) age and form class was satisfactory on July 12, 2012. Utilization was 16% and 1% monitored on December 2, 1994 and December 1, 1995, respectively.

Figure 3-25. DW-MTLC-02-94. Key Browse

Pearl Creek Allotment

Browse Transect PC-2002 – East

Browse transect established in 2002 to monitor bitterbrush and Utah serviceberry. The area is characterized by the mountain brush vegetation type. Relative to shrub cover and native grass and forb cover, wildlife habitat forage diversity and cover has been negatively affected by type-conversion to an exotic crested wheatgrass seeding pasture area during the 1950s-1960s era. The type-conversion was apparently very effective at reducing the density of browse plants like bitterbrush and serviceberry to present observations as isolated plants to scattered shrub stands estimated to comprise less than one percent of the plant composition on the collective East and West fields on the allotment.

2002 Monitoring

Bitterbrush utilization was heavy at 74% and serviceberry utilization was severe at 99% on August 27, 2002. Age class was satisfactory for both plants. Form class was unsatisfactory for both plants. This utilization occurred prior to any potential transitional use during the fall and spring period, or winter period, by mule deer.

2013 Monitoring

Bitterbrush age class was satisfactory and form class was unsatisfactory. Serviceberry age and form class was unsatisfactory due to dead and decadent plants outnumbering seedling and young age class plants.

2002 and 2013 Monitoring

A “total search” (multiple transects over several hundred yards) of the key area locale was needed to obtain adequate monitoring samples in 2002 and 2013. It is highly likely that bitterbrush and serviceberry, both which provides wildlife habitat forage and cover diversity, could be lost from affected sites over time without efforts to reduce chronic heavy to severe use. Both of these shrub species are considered to be long-lived, however, chronic heavy to severe use could result in mortality and lack of seed production for recruitment.

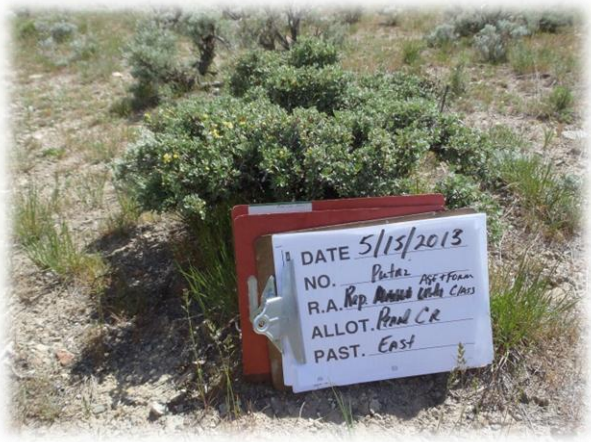


Figure 3-26. PC-2002. Bitterbrush.

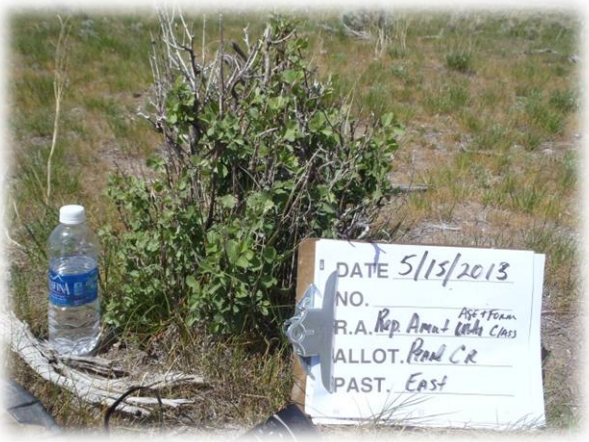


Figure 3-27. PC-2002. Utah Serviceberry.

Robinson Creek Allotment

Key Study Transect DI-RC-01

Transect DI-RC-01 was established on an intact native rangeland area on July 17, 1991. Characterized by the Wyoming big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site. Mule deer seasonal use management emphasis is for Transition Range. Pronghorn: Documented dispersed summer use has been observed. Fall/winter use by winter groups has also been documented on the immediate area and surrounding areas on the allotment. The transect area has not been monitored since 1991, was severely impacted by the 1999 Sadler Fire, and was estimated (ocular) to be in "low seral" status in 2013.

The habitat was rated as being in "Fair" condition as indicated by monitoring completed on July 17, 1991. Sandberg's bluegrass (6.6%); Wyoming big sagebrush (62.2%), bottlebrush squirreltail (4.6%), Hood's phlox (24.9%), wooly locoweed (1.0%), all native species, comprised 99.3% of the entire vegetative sample in 1991. Cheatgrass (0.1%), milkvetch (0.2%) and lupine (0.1%) comprised the remainder of the sample. There was a lack of understory native grass and forb species.

Key Browse Condition Wyoming big sagebrush

The form class was satisfactory and age class unsatisfactory with the latter rating due to dead and decadent plants outnumbering seedling and young age class plants on the transect by a margin of over two to one. Live sagebrush foliar cover was 20.2% and was likely much higher prior to defoliation of dead and decadent sagebrush.

1999 Sadler Fire

Although post-wildfire seeding efforts were completed by BLM, the lack of tall genera native grasses and forbs was a basis for post-Sadler Fire herbaceous plant growth. As of fall 2013, most of the vegetation primarily consists of low-to-the-ground short-rooted plant species such as Hood's phlox, Sandberg's bluegrass and bottlebrush squirreltail. Pre-wildfire shrub foliar cover (20.2%) coupled with dead/decadent sagebrush and associated fuel loads, persistent southwest wind and wildfire flame-lengths helped to carry a wildfire that burned in a "block-burn" configuration. With the exception of isolated intact strips and islands, essentially all of the sagebrush was killed on thousands of acres on this

eastern flank of the Pinon range. Successful big sagebrush re-establishment occurred on the allotment where aerial seeding was completed during winter 2000.

Quaking Aspen

As per the March 2002 Final Report to Elko BLM entitled *The Condition and Trend of Aspen on BLM Lands in North-Central Nevada – With Recommendations For Management, Year Three*: Four aspen stands at the head of the South Fork of Robinson Creek have only experienced regeneration of younger age class trees where protected by fallen older trees. The point-in-time site monitoring visit indicated "heavy use" by trespass domestic sheep either from the adjoining Pony Creek Allotment to the west or Red Rock Allotment to the south. However, concentrations of cattle have been observed by BLM personnel within a curl-leaf mountain mahogany stand within the same headwaters area during the summer period and may contribute to aspen condition concerns.

A fenced area with a quaking aspen stand, that provides a livestock exclosure area, is located on the North Fork of Indian Creek. (See Riparian and Wetland Habitat Data Figure 2-23). Riparian habitat provides forage and cover diversity. The riparian/meadow areas on, and surrounding the allotment, provide the natural fuel breaks needed to potentially slow down or stop wildfires when they are in "good" condition (e.g. Proper Functioning Condition).

Key Study Transect LKA #2 - SF Robinson Creek

Key browse antelope bitterbrush

Browse monitoring was initiated in 2002 on an established rangeland transect to monitor post-1999 Sadler Fire bitterbrush recruitment and re-establishment. An additional "small acreage" wildfire occurred on the general area near the transect in 1996. The site is characterized by the big sagebrush – antelope bitterbrush vegetation type on the gentle slope of a mountain ridge. Bitterbrush was a major shrub component on the area prior to the Sadler Fire (See Figure 3-28). The area has been monitored in association with LKA#2 as an area on public lands with a representative composition of bitterbrush, a key forage species utilized by both big game and livestock.

Bitterbrush form class was satisfactory as monitored on November 27, 2002 and November 14, 2013 with light leader utilization in 2002 (39%) and 2013 (30%). However, 40% and 5% of the sample that has established since the 1999 wildfire, had past year's moderate (approx. 41-60%) to heavy/severe (61% or greater) utilization, respectively, as indicated by form class in 2013. The age class was unsatisfactory in 2013 due to one dead plant outnumbering no seedling and young plants. Bitterbrush on this site continues to provide forage and cover diversity for big game and other wildlife but growth and potential tall stature to several feet or more in height has been suppressed by years of variable light, moderate to severe utilization of those plants observed on the transect since monitoring on the area since the 1999 fire. See Figures 3-29 and 3-30. Bitterbrush plant in a cage since 2001 and non-caged plant comparison.

Figure 3-28. LKA#2

Figure 3-29. LKA#2 Bitterbrush

Figure 3-30. LKA#2 Bitterbrush

Figure 3-31. Robinson Creek Allotment. 10/25/1994

Figure 3-32. Bitterbrush 10/25/1994

Robinson Mountain Allotment

Key Study Transect CDS-RM-01

Transect established on July 16, 1991. Characterized by the big sagebrush – antelope bitterbrush vegetation type within a Loamy 12-14" Precipitation Zone (P.Z.) ecological site. Other vegetation types exist in close proximity to the key area. The area was negatively impacted by the 1999 Sadler Fire. The habitat was rated as being in "Fair" condition in 1991 and 2010.

Key Browse Condition Antelope bitterbrush

The form class improved to satisfactory in 2010 and has been maintained as such as of 2013. Post-Sadler Fire monitoring in 2002 also indicated satisfactory form and age class. The age class has been in satisfactory condition between 1991 and 2013. However, bitterbrush composition has been severely impacted by wildfire and related factors and a "total search" of the key area locale was needed to obtain adequate monitoring samples since 2002. Bitterbrush comprised seven percent of the absolute vegetative cover and 19.2% of the relative plant composition at the key area transect in 1991 compared to no cover or composition in 2010 and 2013. (See Figures 3-33 and 3-34 for representative plants in 2010 and 2013.)

Figure 3-33. CDS-RM-01 July 21, 2010. East

Figure 3-34. CDS-RM-01 July 21, 2010. Bitterbrush

Figure 3-35. CDS-RM-01 May 9, 2013. East

Figure 3-36. CDS-RM-01 May 9, 2013. Bitterbrush

Robinson Mountain FFR Allotment

No quantified terrestrial wildlife habitat condition and trend work has been completed on this "Fenced Federal Range" allotment that encompasses approximately 155 acres of public lands. However, the majority of the allotment is public lands and has important riparian/meadow habitat potential associated with Little Porter Creek. Riparian monitoring was completed on November 7, 2013 (See Riparian and Wetland Habitat Data).

Figure 3-37. Robinson Mountain FFR Allotment

Twin Creek East Allotment

Key Study Transect DY-T-90-07
Transect established on August 7, 1990. Characterized by the Wyoming big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site. The majority of the acreage on the allotment was type-converted to crested wheatgrass (exotic perennial grass) seeding areas in the 1950s to 1960s period (or earlier or later) with reestablishment of sagebrush and very limited native perennial grass and forb reestablishment since this time. The area is emphasized for management as transitional spring-fall range for mule deer. Use would be considered to be widely dispersed or occurring during brief time periods during movement events. Pronghorn population expansion and increases have occurred on the Elko District since the early 1990s where this species would be the primary big game animal currently occurring on the allotment with the exception of pulsed short-term use by mule deer groups during fall and spring migration movements.

The habitat was rated as being in "Fair" condition as indicated by monitoring on May 16, 2013. Crested wheatgrass (84.1%); Wyoming big sagebrush (5.2%); bottlebrush squirreltail, a native grass (8.3%); and bur buttercup, an exotic annual weed (2.2%), comprised 99.8% of the entire vegetative sample in 2013.

Key Browse Condition Wyoming big sagebrush
The form class and age class was unsatisfactory in 2013 due to 61% of the sample as dead or decadent plants and the same outnumbering seedling and young age class plants by 25 to 1.

Figure 3-38. DY-T-90-07 South. May 16, 2013.

Figure 3-39. DY-T-90-07 North. May 16, 2013.

Figure 3-40. Twin Creek East Allotment

Twin Creek North Allotment

Key Study Transect DY-T-88-04

Transect established on June 23, 1988 on an intact native rangeland area. Characterized by the Wyoming big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site. See Twin Creek East Allotment regarding a large percentage of the allotment as crested wheatgrass, mule deer seasonal use management emphasis and pronghorn use.

The habitat was rated as being in "Good" condition as indicated by monitoring completed on May 21, 2013. Sandberg's bluegrass (12.2%); Wyoming big sagebrush (80.1%), bottlebrush squirreltail (5.5%), daisy (1.5%) and green rabbitbrush (less than 1%), all native species, comprised 100% of the entire vegetative sample in 2013. There was a general lack of understory grass and forb species.

Key Browse Condition Wyoming big sagebrush

The form class was satisfactory and age class unsatisfactory with the latter rating due to decadent plants outnumbering seedling and young age class plants.

Figure 3-41. DY-T-88-04 May 21, 2013 East.

Figure 3-42. DY-T-88-04 May 21, 2013 East.

Twin Creek South Allotment

Key Study Transect DY-T-90-08

Transect established on August 7, 1990. Characterized by the Wyoming big sagebrush vegetation type within a Loamy 8-10" Precipitation Zone (P.Z.) ecological site. The majority of the acreage on the allotment was type-converted to crested wheatgrass (exotic perennial grass) seeding areas in the 1950s to 1960s period (or earlier or later) with reestablishment of sagebrush and very limited native perennial grass and forb reestablishment since this time. The area is emphasized for management as transitional spring-fall range for mule deer. Use would be considered to be widely dispersed or occurring during brief time periods during movement events. Pronghorn population expansion and increases have occurred on the Elko District since the early 1990s where this species would be the primary big game animal currently occurring on the allotment.

The mule deer habitat was not rated for monitoring completed in 1990. Sandberg's bluegrass (12.2%); Wyoming big sagebrush (80.1%), bottlebrush squirreltail (5.5%), daisy (1.5%) and green rabbitbrush (less than 1%), all native species, comprised 100% of the entire vegetative sample in 2013. There was a general lack of understory grass and forb species.

Key Browse Condition Wyoming big sagebrush

The form and class was satisfactory in 1990. It was estimated to be in satisfactory form class during an allotment visit on May 21, 2013. Shrub foliar cover is likely between less than 1% to 10% with variation of scattered (less than 1% to 5%) to more dense stands (6-10%) where competition for water and nutrients are reduced during drought conditions compared to stands with higher shrub foliar cover (See Figures 3-44).

Figure 3-43. Livestock Key Area #1 July 28, 2011

Sage-Grouse (sage-grouse) Habitat Monitoring

Habitat management for sage-grouse was emphasized in the 1987 Elko Resource Management Plan-Rangeland Program Summary. Sage-grouse are considered an "umbrella species" where maintenance or improvement of their habitat also helps to maintain or improve the habitat of many other wildlife species that are dependent ("sagebrush obligates") on sagebrush habitat or otherwise utilize these areas on a yearlong or seasonal basis (Rowland 2006).
The following guidelines and instruction memorandum were used to help assess the condition of sage-grouse habitat:

- 2000 Nevada BLM Sage-Grouse Management Guidelines – Excerpt
- Excerpt from BLM Instruction Memorandum (IM) No. 2012-043 as of December 22, 2011. The IM includes recommendations to consider the Sage-Grouse Habitat Assessment Framework completed by the BLM.
- Western Association of Fish and Wildlife Agencies (WAFWA) - Characteristics of sagebrush rangeland needed for productive sage grouse habitat (arid site) - Arid Sites Excerpt (Connelly, et al. 2000).
- Sage Grouse Nesting Cover Studies
- Sagebrush Grasslands Studies

Table 3-1. Characteristics of sagebrush needed for productive sage grouse habitat (arid site)

Vegetation Type	Breeding Habitat		Brood-rearing Habitat		Winter Habitat[2]	
	Height (cm) [3]	Canopy (%)	Height (cm)[3]	Canopy (%)	Height (cm)	Canopy (%)
WAFWA-Sagebrush	30-80	15-25	40-80	10-25	25-35	10-30
Allotment and Key Area						
Achurra Sdg East-N#1-	65.8 (2.16 ft.)	No Data	65.8 (2.16 ft.)	No Data	65.8 (2.16 ft.)	No Data
Achurra Sdg West-N#2-	72.5 (2.38 ft.)	No Data	72.5 (2.38 ft.)	No Data	72.5 (2.38 ft.)	No Data
Browne-DY-T-90-04	31.2 (12.3 in)	7.4	31.2 (12.3 in)	7.4	31.2 (12.3 in)	7.4
Corral Cyn Seeding	74.7 (2.45 ft.)	No Data	74.7 (2.45 ft.)	No Data	74.7 (2.45 ft.)	No Data
Lindsay Cr-Brown #2	66.1 (2.17 ft.)	No Data	66.1 (2.17 ft.)	No Data	66.1 (2.17 ft.)	No Data
Lindsay Cr-Lindsay #3A	64.0 (2.1 ft.)	No Data	64.0 (2.1 ft.)	No Data	64.0 (2.1 ft.)	No Data
Little Porter DY-T-89-08	33.8 (13.3 in.)	9.0	33.8 (13.3 in.)	9.0	33.8 (13.3 in.)	9.0
Merkley-Zunino Sdg KA X	68.9 (2.26 ft.)	5.2%	68.9 (2.26 ft.)	5.2%	68.9 (2.26 ft.)	5.2%
Merkley-Zunino Sdg -Native Range	47-71 (18.5 to 28 in.)	9.8%	47-71 (18.5 to 28 in.)	9.8%	47-71 (18.5 to 28 in.)	9.8%
Mitchell Cr – Elko Seeding	68.6 (27.0 in.)	No Data	68.6 (27.0 in.)	No Data	68.6 (27.0 in.)	No Data
Pearl Creek-West#2	67.1 (2.2 ft.)	No sagebrush in sample	67.1 (2.2 ft.)	No sagebrush in sample	67.1 (2.2 ft.)	No sagebrush in sample
Robinson Mtn KA CDS-RM-01 (native)	42.7 (16.8 in. only green rabbitbrush)	16.9%	16.8 in	16.9%	(No sagebrush in sample)	(No sagebrush in sample)
Robinson Mtn- Mid001	No Data	11.95-16.25%	No Data	11.95-16.25%	No Data	11.95-16.25%
Robinson Mtn-RoseN.-001	No Data	8.15-9.1%	No Data	8.15-9.1%	No Data	8.15-9.1%
Robinson Mtn-Rose-South	No Data	1.0-6.4%	No Data	1.0-6.4%	No Data	1.0-6.4%

Vegetation Type	Breeding Habitat		Brood-rearing Habitat		Winter Habitat[2]	
	Height (cm) [3]	Canopy (%)	Height (cm)[3]	Canopy (%)	Height (cm)	Canopy (%)
Robinson Mtn – West1	67.1 (2.2 ft.)	15.7%	67.1 (2.2 ft.)	15.7%	67.1 (2.2 ft.)	15.7%
Twin CrEast DY-T-90-07 (seeding)	24.1 (9.5 in.)	Less than 1% (0.7%)	24.1 (9.5 in.)	Less than 1% (0.7%)	24.1 (9.5 in.)	Less than 1% (0.7%)
Twin Cr North- LKA1 (seeding)	56.4 (1.85 ft.)	4.8%	56.4 (1.85 ft.)	4.8%	56.4 (1.85 ft.)	4.8%
Twin Cr North – KA DY-T-88-04 (native)	43.2 (17.1 in.)	15.2%	43.2 (17.1 in.)	15.2%	43.2 (17.1 in.)	15.2%
Twin Cr South (seeding)	54.8 (1.8 ft.)	No Data	54.8 (1.8 ft.)	No Data	54.8 (1.8 ft.)	No Data
WAFWA-Grass-forb	>18[2]	>15	Variable	>15	N/A	N/A
Allotment and Key Area						
Achurra Sdg East-N#1	41.0 (1.344 ft.)	No Data	41.0 (1.344 ft.)	No Data	-	-
Achurra Sdg West-N#2-	48.1 (1.58 ft.)	No Data	48.1 (1.58 ft.)	No Data	-	-
Browne DY-T-90-04	6.1 (2.4 in.)	14.7%	6.1 (2.4 in.)	14.7%	-	-
Corral Cyn Seeding	46.8 (1.535 ft.)	No Data	46.8 (1.535 ft.)	No Data	-	-
Lindsay Cr-Brown #2	50.3 (1.65 ft.)	No Data	50.3 (1.65 ft.)	No Data	-	-
Lindsay Cr-Lindsay #3A	36.6 (1.2 ft.)	(11.7% Agcr basal)[4]	36.6 (1.2 ft.)	(11.7% Agcr basal)[4]	-	-
Little Porter DY-T-89-08	6.4 (2.5 in.)	12%	6.4 (2.5 in.)	12%	-	-
Merkley-Zunino Sdg	36.6 (1.2 ft.)	(1.7% Agcr Basal)[4]	36.6 (1.2 ft.)	(1.7% Agcr Basal)[4]	-	-
Merkley-Zunino Sdg DY-T-89-07	5.3 (2.1 in.)	17%	5.3 (2.1 in.)	17%	-	-

Vegetation Type	Breeding Habitat		Brood-rearing Habitat		Winter Habitat[2]	
	Height (cm) [3]	Canopy (%)	Height (cm)[3]	Canopy (%)	Height (cm)	Canopy (%)
Mitchell Cr – Elko Seeding	48.8 (19.2 in.)	NoData	48.8 (19.2 in.)	No Data	-	-
Pearl Creek-East#1	No Data	(23.5% basal)[4]	No Data	(23.5% basal)[4]	-	-
Pearl Creek-West#2	48.8 1.6 ft.)	No Data	48.8 1.6 ft.)	No Data	-	-
Robinson Mtn KA CDS-RM-01 (native)	21.6 (8.5 in.)	37.3%	21.6 (8.5 in.)	37.3%	-	-
Robinson Mtn – West1	23.3 (0.765 ft.)	No Data	23.3 (0.765 ft.)	No Data	-	-
Twin CrEast KA DY-T-90-07 (seeding)	9.1 (3.6 in.)	18.1%	9.1 (3.6 in.)	18.1%	-	-
Twin Cr North LKA1 (seeding)	26.2 (0.86 ft.)	(10.3% Agcr basal) [4]	26.2 (0.86 ft.)	(10.3% Agcr basal) [4]	-	-
Twin Cr North KA DY-T-88-04 (native)	6.6 (2.6 in.)	5.75%	6.6 (2.6 in.)	5.75%	-	-
Twin Creek South (seeding)	36.6 (1.2 ft.)	(15.2% Agcr Basal)[4]	36.6 (1.2 ft.)	(15.2% Agcr Basal)[4]	-	-

[1]Mesic and arid sites should be defined on a local basis; annual precipitation, herbaceous understory, and soils should be considered (Tisdale and Hironaka 1981, Hironaka et al. 1983).
[2]Values for height and canopy coverage are for shrubs exposed above snow which was not monitored.
[3]Grasses and forbs measured as "droop height"; the highest naturally growing portion of the plant. Some transects measured during the summer period after the spring breeding period.
[4]The basal cover of crested wheatgrass, not the canopy (aerial) cover.

Table 3-2. Preferred Forb Availability for Sage-Grouse Breeding Habitat

Allotment/Field Date Monitored	Arid Site Preferred Forb Canopy Cover	Preferred Forb Availability #	Comments
Achurra Sdg West Field -N#2- August 4, 2011	Canopy Cover not Monitored – see comments	"2"	Forage Production completed. Preferred forbs comprised 0.73% of sample. "Other Forb": Lupine comprised 4.0%. Achurra Sdg East Field -N#1- Not Sampled.
Corral Cyn Seeding July 26, 2011	Canopy Cover not Monitored – see comments	"4"	Forage production completed. Preferred forbs comprised 2.4% of sample. "Other Forb": Lupine comprised 5.55%.
Lindsay Cr-Lindsay #3A June 21, 2011	Canopy Cover not Monitored – see comments	"5"	Nested Frequency completed with 5 preferred forbs encountered. Bur buttercup (invasive weed") was the most frequently encountered. Brown Field #2 not sampled.
Merkley-Zunino Sdg June 8, 2011	Canopy Cover not Monitored – see comments	"10"	Nested Frequency completed with 10 preferred forbs encountered. Bur buttercup was the most frequently encountered.
Merkley-Zunino Sdg DY-T-89-07 April 17, 2014	4.25%	"5"	Marginal preferred forb canopy cover. Marginal forb availability. (Bur buttercup had the highest relative herbaceous plant composition.)
Mitchell Cr – Elko Seeding	Canopy Cover not Monitored – see comments	"3"	Forage production completed. Preferred forbs comprised 1.1% of sample. Bur buttercup (invasive weed") was present (0.1%)
Pearl Creek – East#1 June 8, 2011	Canopy Cover not Monitored – see comments	"10"	Nested Frequency completed with 10 preferred forbs encountered. Bur buttercup and lupine ("other forb") were the most frequently encountered. No forb data for Pearl Creek-#2 West Field
Robinson Mtn KA CDS-RM-01 (native) June21,2010	4.75%	"10"	Sage-grouse sign observed. Canopy (and basal) cover from Line Intercept
Robinson Mtn-Middle Pasture Mid001 June 22, 2010	Canopy Cover not Monitored – see comments	"3"	Rangeland ("Clip/Estimate") Monitoring
Robinson Mtn-RoseN.-001 June 22, 2010	Canopy Cover not Monitored – see comments	"1"	Rangeland ("Clip/Estimate") Monitoring indicated Hood's phlox as the only preferred forb apparently encountered and sampled
Robinson Mtn-Rose Field Seeding LKA#1-South June 21, 2010	Canopy Cover not Monitored – see comments	"1"	Trend lek in the area. Rangeland ("Clip/Estimate") Monitoring indicated Hood's phlox as the only preferred forb encountered and sampled.

Allotment/Field Date Monitored	Arid Site Preferred Forb Canopy Cover	Preferred Forb Availability #	Comments
Robinson Mtn – West1 June 23, 2010	Canopy Cover not Monitored – see comments	"7"	Nested Frequency completed with 7 preferred forbs encountered. Hood's phlox was the forb most frequently encountered.
Twin CrEast KA DY-T-90-07 (seeding) May 16, 2013	Less than 1% (0.01%)	"1"	Canopy (and basal) cover from Line Intercept. Sage-grouse sign (droppings) observed on March 30, 2012.
Twin Cr NorthLKA1 (seeding) July 21, 2011	Canopy Cover not Monitored – see comments	"2"	Nested Frequency completed with 2 preferred forbs "infrequently" encountered. Bur buttercup was the most frequent forb encountered.
Twin Cr North – KA DY-T-88-04 (native) May 21, 2013	0.3%	"1"	Canopy (and basal) cover from Line Intercept.
Twin Cr South (seeding) June 9, 2011	Canopy Cover not Monitored – see comments	"2"	Nested Frequency completed with 2 preferred forbs encountered. Bur buttercup (invasive weed) and Blue-eyed Mary (Preferred forb) were the most frequent forbs encountered.

Mitchell Creek Allotment

Crested Wheatgrass Seeding Areas

No specific wildlife habitat key areas have been established on crested wheatgrass seeding areas within the allotment. The "droop height" of crested wheatgrass was recorded in 2011. Utilization data collected between 1987 and 2012. Shrub foliar cover quantification or estimates, in regard to the re-establishment of sagebrush within these seeding areas, can help determine the quality of habitat these areas are providing for wildlife species. Scientific references (McAdoo 1989) were used to help make any determinations on habitat quality.

Range Key Area 1 Elko Seeding

Crested wheatgrass droop height measurements averaging 19.2 inches and Wyoming big sagebrush height averaging 27 inches on July 19, 2011, suggest that the Elko Seeding area provides suitable nesting and early (upland) brood-rearing habitat (Figure 3-45). Crested wheatgrass height was likely similar in 2012 as monitoring resulting in 20% utilization on September 13, 2012. Shrub foliar cover was estimated to be varied with upper end of 8-10% in 2012 although Wyoming big sagebrush exhibited drought stress (withering of leaves and onset of leaf defoliation). The height and cover provided by Wyoming big sagebrush and crested wheatgrass likely meet or exceed WAWFA guidelines in 2011-12. A sage-grouse was observed in the immediate transect area on July 19, 2011 and droppings were observed about 0.5-mile north of the transect on September 13, 2012. There are sage-grouse lek locations on the general seeding area.

Figure 3-44. Range Key Area 1 Elko Seeding Preliminary Priority Habitat

Range Key Area 3 White Pine Seeding

Compared to the Elko Seeding pasture, an ocular estimate suggests that the White Pine does not provide suitable lateral grass and forb nesting cover for sage-grouse as of 2012. The "low" production and composition of herbaceous vegetation, including crested wheatgrass as the primary seeded species, has been quantified by monitoring in 2011. Crested wheatgrass production and composition apparently followed this trend as observed during monitoring in 2012. Black-tail jackrabbits have contributed to an undetermined percent of overall herbaceous vegetation utilization (McAdoo 2003); they were observed during monitoring efforts in 2012. However, jackrabbits also inhabit the Elko Seeding which is in much better condition in comparison in 2012. Wyoming big sagebrush foliar cover, which is also needed for nesting cover, was estimated to be approximately 8-10% in 2012 and would, otherwise, help to meet guidelines for sage grouse nesting cover.

Figures 3-45 and 3-46 Range Key Area 3 White Pine Seeding Preliminary Priority Habitat

Table 3-3. Line Intercept by Allotment

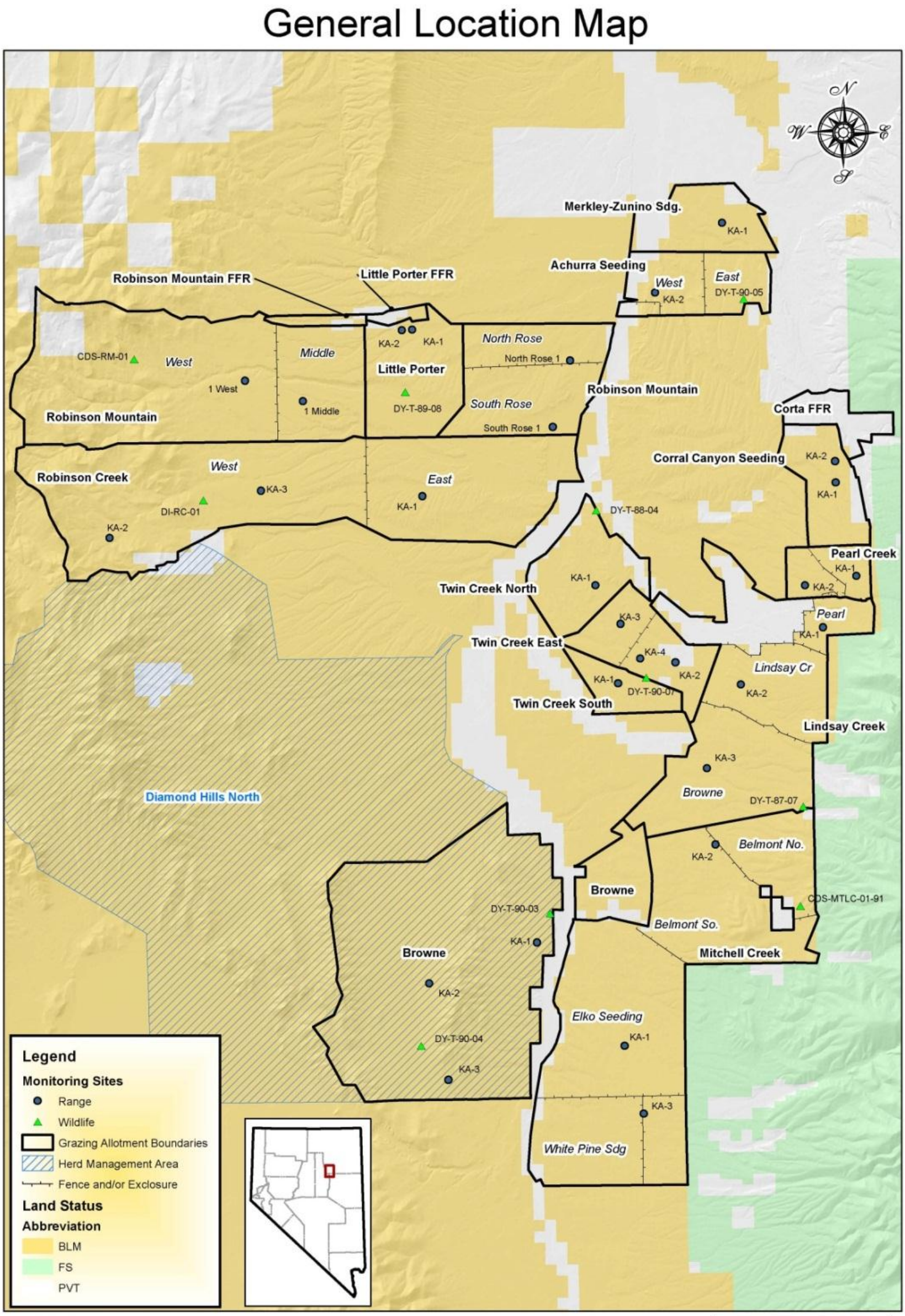
Allotment	Key Area	Year	Grasses						Forbs	Shrubs		
			AGCR	ORHY	POSE	POBU	SIHY	STTH2	PPFF	ARTRW	CHVI8	Jun
Browne	#1	2011	0	1%	0	0	0	2%	0	82%	14%	0
Lindsay	#1	2011	0	5%	1%	1%	2%	0	1%	0	83%	6%
Creek	#3	2011	81%	0	19%	0	0	0	0	0	0	0
Little	#1 N	2011	0	3%	0	0	3%	0	0	94%	0	0
Porter	#2 SD.	2011	9%	0	0	0	0	1%	0	91%	0	0
Merkley-Zunino Seeding	#1SDG	2011	25%	0	0	0	0	0	0	75%	0	0
Pearl Creek	#1	2011	29%	0	18%	17%	0	0	0	0	0	0
Twin Creek East	East #1	2011	72%	0	4%	0	0	0	0	24%	0	0
Twin Creek North	KA #1	2011	68%	0	0	0	0	0	0	19%	13%	0
Twin Creek South	KA #1	2011	100%	0	0	0	0	0	0	0	0	0
FORBS- Pearl CR #1: ASTRA 1%, LUPINE 34% Browne #1- LEPU 2%												

Table 3-4. Droop Heights by Allotment

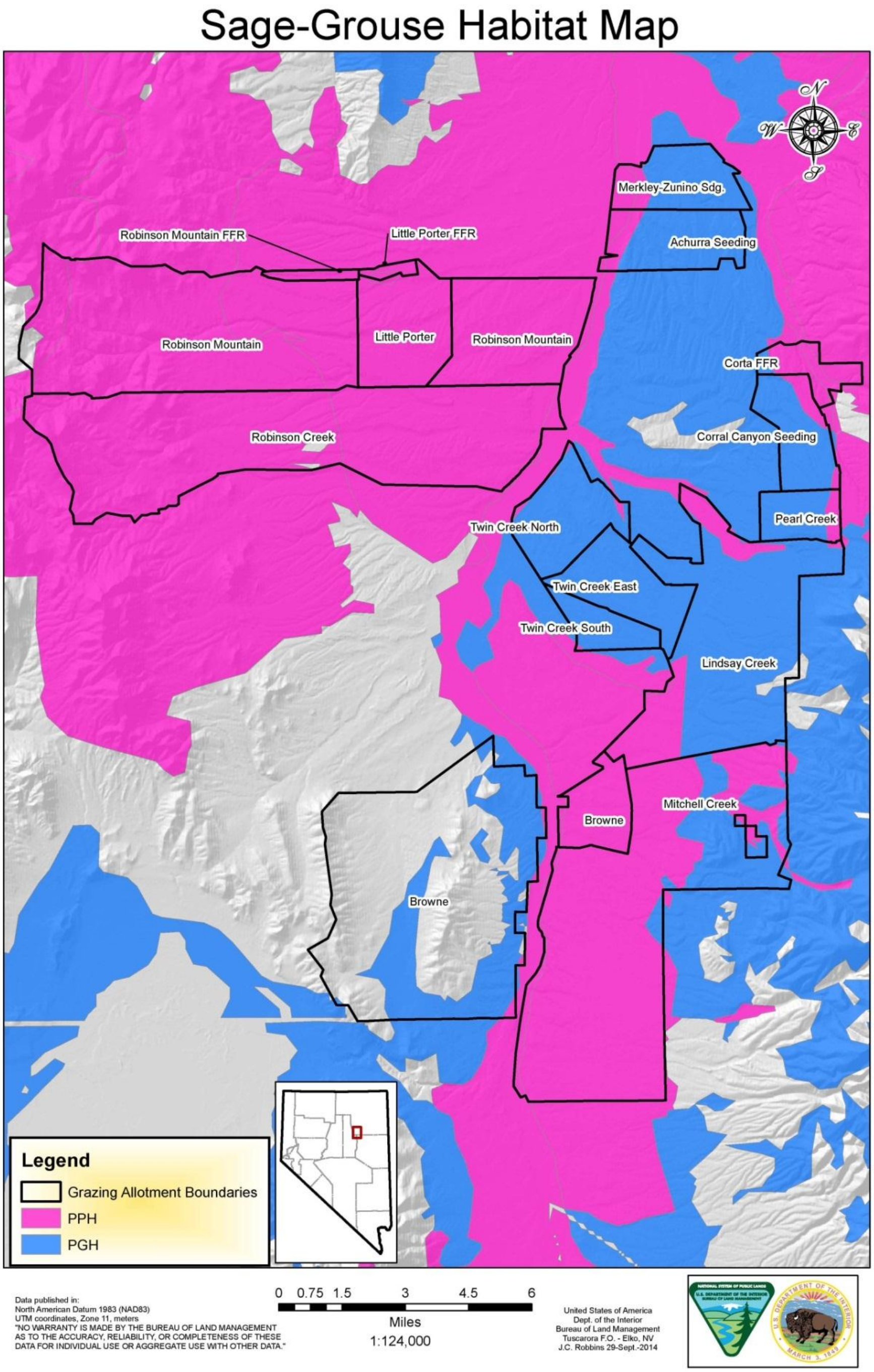
Allotment Pasture	Key Area	Year	Droop Height Averages Measurements in foot increments				
			AGCR	AGDA	ORHY	STTH2	ARTRW
Achurra Seeding							
East	#1	2011	1.3	0	0	0	2.2
West	#2	2011	1.6	0	0	0	2.4
Browne							
Main	#2	2011	0	0	1.3	1	2.2
Main	#3	2011	0	0	0	0	2.2
Corral Canyon Seeding	#1	2011	1.6	0	0	0	2.5
Lindsay Creek							
Brown	#2	2011	2	0	0	0	2.1
Lindsay	#3	2011	1.2	0	0	0	2.1
Little Porter							
Native	#1	2011	0	0	1	1	2
Merkley-Zunino Seeding							
	#1	2011	1.2	0	0	0	2.3
Mitchell Creek							
Elko Seeding	#1	2011	1.6	0	0	0	2.2
Belmont South	#2	2011	0	1.5	1.1	0	2.3
White Pine	#3	2011	1.3	0	0	0	2.2
Pearl Creek							
West	#2	2011	1.6	0	0	0	2.2
Twin Creek East	East 1	2011	1.3	0	0	0	2
	West 1	2011	1.1				2
Twin Creek North	KA #1	2011	.9	0	0	0	1.8
Twin Creek South	KA #1	2011	1.2	0	0	0	1.8

Appendix B. Maps

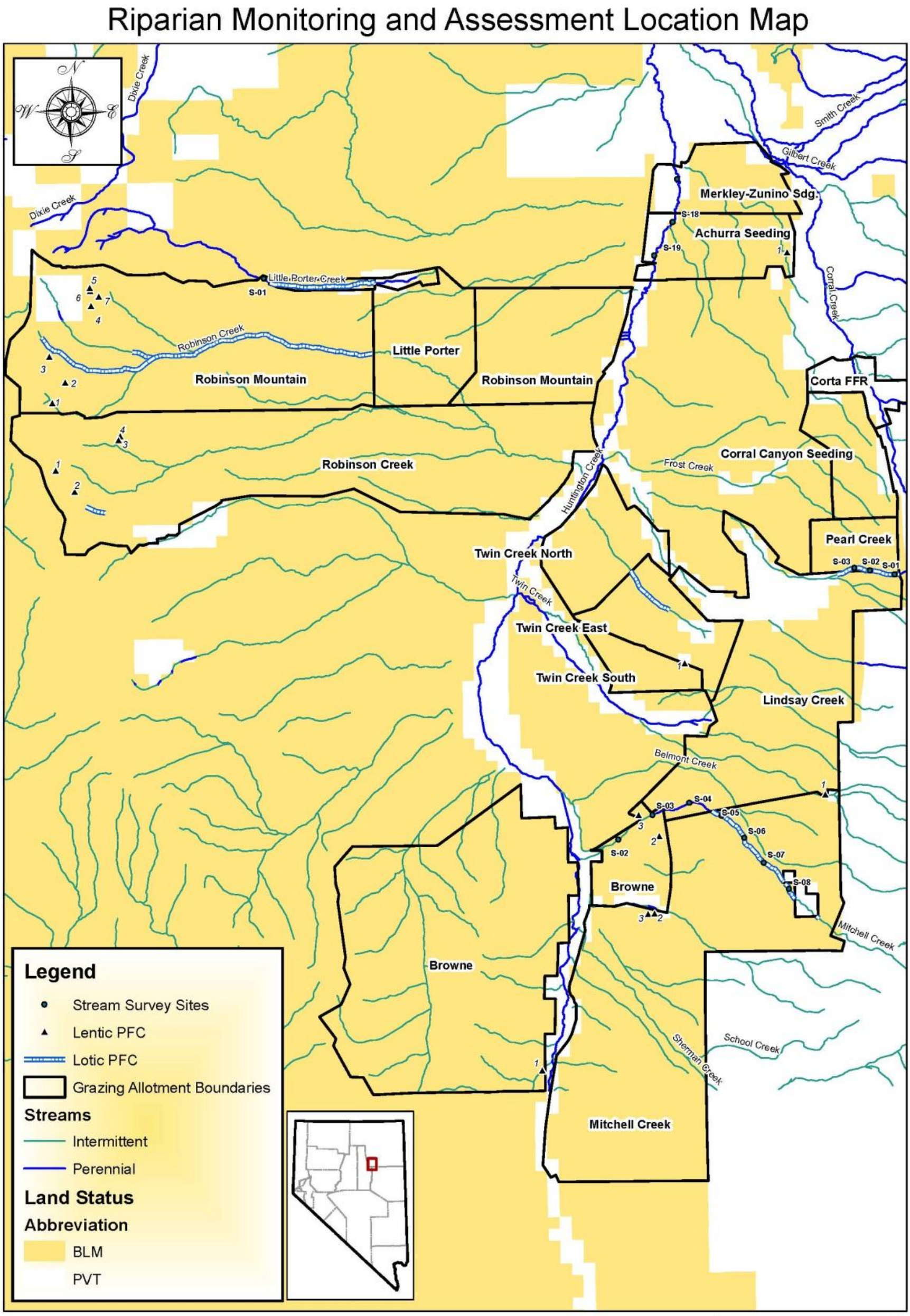
Map 1. General Location and Key Areas of the South Jiggs Complex.



Map 2. Greater Sage-Grouse Habitat within the South Jiggs Complex.



Map 3. South Jiggs Complex Riparian Monitoring Locations.



Appendix C Proper Functioning Condition (PFC) Definitions

Lotic (flowing water) riparian habitats (Prichard et al. 1998)

Proper Functioning Condition (PFC): A riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to: dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; support greater biodiversity.

Functional-at-Risk: Riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Non-functional: Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality, etc.

Lentic (standing) water riparian habitats (Prichard et al. 1999, Revised 2003)

Proper Functioning Condition (PFC): Lentic riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to: dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality; filter sediment and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize islands and shoreline features against cutting action; restrict water percolation; develop diverse ponding characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, water-bird breeding, and other uses; and support greater biodiversity.

Functional-at-Risk: Riparian-wetland areas that are in functional condition but have an existing soil, water, or vegetation attribute that makes them susceptible to degradation.

Non-functional: Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or woody debris to dissipate stream energy associated with flow events, and are not reducing erosion, improving water quality, etc.

Appendix D. Plant Codes Identification

Plant Code	Common Name	Scientific Name
AAFF	Unknown Annual Forb	--
AGCR	Crested wheatgrass	*Agropyron cristatum*
AGDA	Thickspike wheatgrass	*Agropyron dasystachyum*
AGGL (AGOSE)	Pale Agoseris	*Agoseris glauca*
AGSM	Western Wheatgrass	*Agropyron smithii*
AGSP	Bluebunch wheatgrass	*Pseudoregeneria spicata*
ALLIUM	Tapertip onion	*Allium acuminatum* Nutt.
ARABI2	Rockcress	*Arabis* L.
ARAR8	Little Sagebrush	*Artemisia arbuscula*
ARTR2	Big Sagebrush	*Artemisia tridentata* Nutt.
ARTRW	Wyoming Big Sagebrush	*Artemesia tridentata* spp. *Wyomingensis*
ASTER	Aster	*Aster* L.
ASTRA	Milkvetch	*Astragulus* L.
BASA	Arrowleaf Balsamroot	*Balsamorhiza saggitata*
BRASS	Mustard	*Brassica* L.
BRTE	Cheatgrass	*Bromus tectorum*
CHNA	Rubber Rabbitbrush	*Ericameria nauseosa*
CHVI8	Green Rabbitbrush	*Ericameria teretifolia*
COPA	Maiden blue eyed Mary	*Collinsia parviflora*
CRAC2	Tapertip Hawksbeard	*Crepis acuminata*
CRYPT	Cryptantha	*Cryptantha* Lehm. Ex G. Don
DELPH	Larkspur	*Delphinium* L.
ELCI2	Great Basin Wild-rye	*Leymus cinerus*
EPILO	Willowherb	*Epilobium* L.
ERIOG	Buckwheat	*Eriogonium* Spp.
FEID	Idaho fescue	*Festuca idahoensis*
GAYOP	Spreading groundsmoke	*Gayophytum diffusum*
HAGL	Saltlover	*Halogeton glomeratus*
JUOS	Utah Juniper	*Juniperus osteosperma*
LEPU	Common Pepperweed	*Lepidium densiflorum* Schrad.
LIRU4	Western Stoneseed	*Lithospermum ruderale*
LOMAT	Desertparsley	*Lomatium* Raf.
LUPIN	Lupine	*Lupinus* L.
ORHY	Indian Ricegrass	*Oryzopsis hymenoides*
ORTHO	Owls-Clover	*Orthocarpus* Nutt.
ORWE	Webbers Needlegrass	*Oryzopsis webberi*
PENST	Palmer's Penstemon	*Penstemon palmeri*
PHHO	Hoods phlox	*Phlox hoodii*
PHLO	Longleaf Phlox	*Phlox longifolia*
PONE3	Nevada Bluegrass	*Poa nevadensis*
POSE	Sandberg's bluegrass	*Poa secunda*
PPFF	Unknown Perennial Forb	--

Plant Code	Common Name	Scientific Name
PUTR2	Antelope bitterbrush	*Purshia tridentata*
RATE	Curveseed butterwort	*Ceratocephala testiculata*
SIHY	Squirreltail	*Elymus elemoides*
STIPA	Needlegrass	*Stipa* ssp.
STTH	Thurber's needlegrass	*Stipa thurberianum*
TETRA3	Horsebrush	*Tetradymia* DC

Appendix E. References

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